Site waste management

Guidance and templates for effective site waste management plans

NHBC Foundation
Housing research & development in partnership with BRE Trust

wrap
Material change for a better environment

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July 2008

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FOREWORD

Construction and demolition waste accounts for close to a third of all waste generated in the UK. The construction industry uses approximately 400 tonnes of materials each year, but a large proportion can end up as site waste which has both a financial and environmental impact.

Site waste management is a key element of The Code for Sustainable Homes and has become a regulatory requirement with the implementation of The Site Waste Management Plans Regulations in April 2008 for projects with an estimated project cost of £300 000 or more.

Working in partnership with WRAP (the government-funded Waste & Resources Action Programme), NHBC Foundation has produced this guidance looking at issues around the formulation and implementation of site waste management plans (SWMPs). With such a large proportion of materials ending up as waste the potential benefits for the environment, as well as the purely commercial benefit of reduced costs, are clear.

This guide details how SWMPs can be developed and how effective implementation can make a tangible difference in tackling the issue of site waste, and goes further to address issues of waste in the supply chain and the design process as a whole. At the design stage reducing the volume and types of materials specified can have a significant impact, as can efficient management of supply chains and contractors, particularly if commitments to reduce waste are written in to contracts.

The guide has been produced to ensure that all parties involved in the construction process, from clients though to trade contractors, understand their role and responsibilities for effective waste management. It details standard practice (the minimum required to comply with the Regulations) and also highlights what would be considered as good and best practice to enable builders to benchmark, monitor and improve their working practices. Examples of good practice include:

- Appointing a waste champion
- Issuing contracts specifying waste reduction
- Monitoring waste generation and performance against the SWMP
- The use of balers and other compaction systems to reduce the physical size of waste
- Segregation of waste materials (if space allows)
- Involving the workforce and encouraging their suggestions for waste reduction
- Recycling of demolition waste into higher value applications
- Centralised and managed site storage for materials.

The comprehensive examples and supplementary templates will help ensure that the development and operation of compliant SWMPs is effectively achieved.

Under the new Regulations, clients will be required to draw up a SWMP before construction work begins, at which point the principal contractor will take over responsibility for its implementation. Where no principal contractor is in place, responsibility for implementation remains with the client. SWMPs are also a mandatory aspect of The Code for Sustainable Homes, which is currently in force for all homes, although only public sector housing has to comply with a greater than nil rating at present.

Site waste continues to be of great interest to the industry with the rising costs of landfill, the potential for savings and the requirements of The Code for Sustainable Homes. I am confident this guide will prove a valuable resource in meeting the needs of regulatory change whilst bringing real benefits for builders, consumers and the environment.

Imtiaz Farookhi

Chief Executive, NHBC

PREFACE

Navigating the guide

This guide is aimed at everyone involved in the management of onsite waste. Because it covers many aspects of managing waste it may not be necessary for you to read the whole of the guide. Therefore the following symbols have been included at the beginning of each section to help you find the information relevant to your specific area of interest:


Clients/designers


Principal contractor


Waste management contractor(s)


Trade contractor(s)

Templates and CD-Rom

This guide includes templates which have been completed with the type of information you may include in your own templates (the information is shown in red on the templates in the guide). These templates are also included on the CD-Rom disk which is found in the pocket on the inside back cover. The templates are in two formats: as Excel files and as PDFs. All of the templates on the CD-Rom are blank ie the information shown in red in the printed guide has been deleted. The templates included on the CD-Rom are identified in the guide by the symbol CD.

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SECTION 1

BACKGROUND AND GENERAL GUIDANCE

Who should read this section?				
Section 1 Background and general guidance	✔	✔	✔	✔

Introduction

The management of onsite waste is becoming increasingly important to the house building industry. Not only is there a requirement to comply with environmental legislation (including The Site Waste Management Plans Regulations which came into force in April 2008),[1.1] but also to achieve cost savings by implementing good environmental practice.

The construction industry uses an estimated 400 million tonnes of resources every year with 100 million tonnes ending up as waste.[1.2] Construction projects involving multiple contractors can lead to confusion about who is responsible for environmental issues with implications for management of waste and disposal, licensing and permits, and working out who is responsible when things go wrong.

In order to simplify the management of site waste, the NHBC Foundation and the Waste and Resources Action Programme (WRAP) funded research carried out by BRE to help the housebuilding industry write and implement site waste management plans (SWMPs) and recognise the associated benefits of putting these plans into practice. This guide provides the findings of this research.

The guide provides information on how waste created during the construction process can be managed more effectively as a result of writing and implementing a SWMP.

SWMPs mainly focus on the management of onsite waste; however, there are opportunities to link into other stages of the construction process and embed the SWMP within a company's site procedures. For example:

- Design – designing out waste and reducing the types and amounts of materials used
- Procurement – establish systems and methods of procuring materials including supply chain integration
- Management of contractors – oblige waste management contractors and trade contractors to participate in the waste management process including any onsite activities eg segregation of waste materials.

Therefore the planning for management of waste can, and should, be included at the design and procurement stage. Section 2 of this guide provides an overview of how a SWMP can be included in the procurement process, including recommendations on how to achieve good practice.

1.1 How to use the guide

The guide is aimed at each party involved in the construction process: clients and designers, the principal contractor, waste management contractors and trade contractors. However a contract is organised, each party will probably be interested in the specific areas of waste management and resource efficiency they are responsible for. For example, clients and designers may be interested in the management of resources at the planning and design stages, while trade contractors may focus on their specific areas of involvement eg fit out stages.

The guide is therefore divided into five distinct sections, each covering specific information on managing waste.

1.2 What is in the guide

Section 1 Background and general guidance

Section 1 includes the benefits of site waste management plans, a summary of The Site Waste Management Plans Regulations 2008,[1.1] waste management requirements for compliance with The Code for Sustainable Homes[1.2] and how to prepare a SWMP. Case studies of housing developments that have used good waste management practices and the benefits achieved from implementing the practices are also included.

Section 2 Procurement guidance

Guidance on setting requirements for good and best practice during the procurement process.

Section 3 Waste management practice: Guidance and templates

Part 1: Standard practice: guidance and examples of templates for compliance with The Site Waste Management Regulations and the mandatory requirements for The Code for Sustainable Home, for all projects with an estimated project cost of greater than £300 000.

Part 2: Good practice: guidance and examples of templates for compliance with The Site Waste Management Regulations and the mandatory requirements for The Code for Sustainable Homes; and achievement of additional benefits such as cost savings, for all projects with an estimated project cost of greater than £300 000.

Part 3: Best practice: guidance and examples of templates for compliance with The Site Waste Management Regulations, the mandatory requirements and additional credits for The Code for Sustainable Homes; and achievement of additional benefits, such as cost savings, enhanced corporate and social responsibility and improved efficiency, for all projects with an estimated project cost of greater than £300 000.

Fictitious projects have been used for each type of practice to illustrate how to achieve an effective SWMP.

Section 4 Procurement of contractors: Waste management procedures for contracts

Section 4 covers waste management procedures and statements which can be used in contracts when awarding and/or appointing contractors.

Section 5 Appendix: Checklists of responsibilities by job role

The Appendix provides examples of questions (in checklist form) to ask operatives, the waste champion, trade contractors and site managers/project managers. The checklists will help in the writing and implementation of a SWMP.

Table 1 provides an at-a-glance guide to each section of the guide. It identifies which sections are relevant to each party reading the guide using the symbols which are also included at the beginning of each section.

TABLE 1

Where to find information in the guide

	Clients/ designers	Principal contractor	Waste management contractor(s)	Trade contractor(s)
Section 1 Background and general guidance	✔	✔	✔	✔
Section 2 Procurement guidance	✔			
Section 3 Standard, good and best practice guidance	✔	✔		
Section 4 Procurement of contractors: Waste management procedures and statements for contracts		✔	✔	✔
Section 5 Checklists of responsibilities by job role		✔		✔

1.3 Background

Construction and demolition waste accounts for nearly a third of all waste in the UK (333 million tonnes per year): 109 million tonnes were generated in England and Wales in 2005, with an unknown proportion arising from the house building sector. Waste is defined as 'any substance or object which the producer or the person in possession of it, discards or intends or is required to discard'.[1.4]

Legislation that applies to construction and demolition waste originates from the requirement to protect the environment in terms of the management of waste produced (The Environmental Protection Act 1990).[1.5]

The government and industry in the UK follow the principles of the waste hierarchy (see Figure 1) which was first introduced into European Union (EU) waste policy in 1975 (The Waste Framework Directive).[1.6] The waste hierarchy indicates that waste should be prevented in the first instance, and what cannot be prevented should be reused, recycled and recovered, with landfill being used as little as possible. Landfill is seen as the worst option for the environment as it signifies a loss of resources and could be a future environmental liability.

Much of UK and EU legislation encourages waste producers to move towards a more sustainable approach to managing their waste (ie following the waste hierarchy).

Figure 1 The waste hierarchy.

Waste occurs largely due to:

- Over-ordering
- Poor design brief resulting in offcuts from varying sizes of materials/products
- Changes in the construction programme eg materials delivered but not required
- Storage and movement of materials
- Site clearance
- Packaging
- Inefficient working practices eg using incorrect materials because it is easier to do so or wasteful cutting of materials.

Waste generation and its subsequent management have implications for all phases of a building's life cycle. There are a few examples of best practice regarding waste generation and resource management in the house-building industry but these have often been led by client requirements/aspirations, eg Greenwich Millennium Village achieved a reduction of 50% in waste generation by setting waste reduction targets and engaging the whole supply chain in waste minimisation. More clients and/or contractors, including house-builders, are beginning to manage their waste much more effectively on sites through better planning and setting recycling and recovery targets.

Originally, SWMPs were developed as a DTI voluntary Code of Practice in 2004[1.7] aimed at clients and contractors. It set out a basic structure for waste minimisation and guidance on how to use SWMPs more effectively. In April 2008, the writing and implementing of SWMPs became compulsory for construction projects with project costs greater than £300 000 in England, following a government consultation. SWMPs are already required by some planning authorities and as part of The Code for Sustainable Homes (see page 8 for further information on the Code).[1.3] Under the Site Waste Management Plans Regulations 2008,[1.1] the client is responsible for writing a SWMP before construction work commences and then the responsibility passes on to the principal contractor for implementation and post-construction review; if there is no principal contractor then the responsibility remains with the client.

The Site Waste Management Plans Regulations 2008 set out two levels of SWMP:

- Basic – The basic SWMP is for projects with an estimated project cost of between £300 000 and £500 000.
- Detailed – The detailed SWMP is for projects with an estimated project cost of greater than £500 000. More information needs to be included compared with the standard SWMP.

Adopting a site management approach to waste, based around an effective SWMP, can bring housebuilders many benefits including:

- Reducing the amount of material that is used which saves money, time and effort
- Reducing waste and recovering waste, saving money
- Increased compliance with environmental legislation
- Reduced impact on the environment
- Improved working conditions
- Supporting green credentials
- Improved market position.

Moreover, most clients are increasingly requiring improved environmental performance and evidence by specifying use of waste monitoring and targets. For example, credits can be gained under BREEAM (BRE Environmental Assessment Method) for segregating and monitoring waste onsite and a SWMP is a mandatory requirement under The Code for Sustainable Homes.[1.3]

The sooner a company embeds a SWMP within their policies and procedures, the quicker it can implement resource-efficient work practices, creating greater benefits all round.

1.4 Summary of the Site Waste Management Plans Regulations 2008 and additional requirements

1.4.1 Requirements before commencement of the project

Construction projects with an estimated project cost of greater than £300 000 must have a written SWMP before construction work begins onsite under the Regulations.

The SWMP must identify the:

- Person who drafted the SWMP
- Person in charge of the construction project
- Principal contractor
- Location of the site.

Requirements about the estimated cost:

- Provide a statement with regard to minimising the amount of waste produced
- Description of each waste type
- Estimate the volume of each waste type
- Identify the waste management action for each waste type
- Ensure that Duty of Care requirements[1.8] are followed ie waste is managed appropriately.

1.4.2 Projects of £500 000 or less

When the waste is removed:

- Identity of the waste management contractor
- Types of waste removed
- The site the waste management contractor is taking the waste to.

Within one month of completion of the work:

- Confirmation of monitoring and an explanation of any deviation from the SWMP.

1.4.3 Projects greater than £500 000

When waste is removed:

- Identity of the waste management contractor
- Copy or reference to the waste carrier registration
- Written description of the waste.

As often as necessary (not less than every six months):

- Review the SWMP
- Record the types and quantities of waste produced
- Record the types and quantities of waste that have been:
  - Reused (onsite and offsite)
  - Recycled (onsite and offsite)
  - Sent for another form of recovery onsite and offsite
  - Sent to landfill
  - Otherwise disposed of.

Within three months of completed work:

- Confirmation that the SWMP has been monitored on a regular basis
- Explanation of any deviation from the SWMP
- A comparison of estimated quantities of waste type against actual quantities
- Estimate of cost savings.

For all projects, the SWMP must be kept at the site office at the project site. It must be kept for two years after the completion of the project at the principal contractor's main place of business or at the project site.

Details of these Regulations and associated guidance can be found at www.defra.gov.uk/constructionwaste.

Box 1 lists sources of information about onsite waste management.

1.5 The Code for Sustainable Homes

Companies striving to achieve The Code for Sustainable Homes[1.3] or their projects are required to write and implement a SWMP (or specification) unless estimated project costs are less than £300 000. The mandatory element is as follows:

- A SWMP must be developed and implemented. This will require the monitoring and reporting of defined waste groups generated onsite, and compliance with legal requirements as set in the Regulations[1.1] for and with best practice. Specific targets are not required.

Credits are given for:

- Credit A: The SWMP must include procedures and commitments for reducing waste generated onsite in accordance with best practice and the defined waste groups (1 credit)

  and

- Credit B: The SWMP must include procedures and commitments to sort and divert waste from landfill (reuse, recycle, compost or otherwise recover) according to the defined waste groups. This must be performed either onsite or through a licensed, external contractor, in accordance with best practice (1 credit).

Credit B cannot be obtained without first gaining credit A.

The SWMP must be written at the design stage and completed at the post-construction stage. The good practice templates and guidance in section 3 in this guide comply with the mandatory element for The Code for Sustainable Homes requirements and the best practice section provides templates and guidance for the additional credits. These should be viewed alongside the latest technical guidance linked to the The Code for Sustainable Homes.

For further information, please see: www.planningportal.gov.uk/england/professionals/en/1115314116927.html.

BOX 1

Where to find out more – Onsite waste management

There are many sources of information related to onsite waste management and the development of SWMPs.

Government departments

Defra originally consulted the construction industry on making SWMPs a legal requirement for projects with an estimated cost of greater than £250 000 threshold in England. As a result of the consultation the Site Waste Management Regulations 2008 have been developed for projects with estimated project costs of greater than £300 000. Non-statutory guidance has also been published. Information can be found at www.defra.gov.uk/constructionwaste. The DTI (now BERR) also published *Guidance for construction contractors and clients. Voluntary code of practice* in July 2004.[1.9]

The Code for Sustainable Homes has a mandatory requirement for SWMPs. Guidance can be downloaded from: www.planningportal.gov.uk/england/professionals/en/1115314116927.html.

Local authorities

A few local authorities require SWMPs as part of their planning process:

Bedfordshire and Luton

www.luton.gov.uk/internet/environment/planning/local_plan_waste/Local%20plan%20-%20waste.

East Sussex and Brighton and Hove

www.planningportal.gov.uk/england/professionals/en/1115314116927.html.

Gloucestershire

www.gloucestershire.gov.uk/index.cfm?articleid=10581.

BRE

Leading centre of expertise in construction, including construction resource efficiency: www.bre.co.uk. A free web-based SWMP tool has been developed which can be used at both a project and company level; this can be accessed at www.smartwaste.co.uk.

Carillion

Details all of Carillion's case studies surrounding sustainability: www.carillionplc.com/sustain-2002/Z.Case%20Records.htm.

CIRIA

Many publications relating to onsite waste management and best practice:

www.ciria.org.uk. Also has information on construction recycling sites: www.ciria.org/recycling.

Constructing Excellence

Case studies, regional clubs and information on key performance indicators including waste: www.constructingexcellence.org.uk.

Construction Industry Environment Forum

Regular events held on sustainable construction including waste management and resource efficiency: www.cief.org.uk.

Environment Agency

Free guide available on SWMPs from: www.netregs.gov.uk/netregs/legislation/380525/1555007/?version=1&lang=_e.

Envirowise

Offers UK businesses free, independent, confidential advice and support on practical ways to increase profits, minimise waste and reduce environmental impact: www.envirowise.gov.uk.

WRAP

Practical guidance and SWMP tools to help improve materials resource efficiency at every stage: www.wrap.org.uk.

1.6 Preparing a site waste management plan

The type of SWMP required is very much dependent upon a company's culture, nature of business, procedures and practices, and the size and type of project. A SWMP will need to contain less detail in a small construction project compared with a larger project (Table 2, p.11).

1.6.1 Standard practice site waste management plan

Standard practice is the baseline performance for the construction industry based on achieving minimum standards and legal requirements. A standard practice SWMP complies with legal requirements for an estimated project cost over £300 000. To achieve standard practice a SWMP should identify:

- A person responsible for the SWMP
- The types of waste that will be generated
- Waste management options

- The use of appropriate and licensed waste management contractors and sites
- A plan for monitoring and reporting on the quantity of waste.

1.6.2 Good practice site waste management plan

Good practice strives to gain benefits that are easy to achieve without changing fundamental working practice and are at least cost neutral. Good practice goes a step further than compliance with the Site Waste Management Regulations 2008 and achieves compliance with the mandatory requirement under The Code for Sustainable Homes. To achieve good practice, standard practice should be followed plus:

- Achieve material waste segregation on or offsite
- Set a waste recovery target with the waste management contractor employed on the project
- Assign responsibility to the site manager or appropriate person to implement the SWMP.

1.6.3 Best practice site waste management plan

Best practice reflects the leading industry approach and may require a significant change in working practice with increased costs (however, greater cost savings could be realised). Following best practice will help achieve the additional credits under The Code for Sustainable Homes for site waste management. To achieve best practice, standard and good practice should be followed plus:

- Require trade contractors to disclose at the tender stage how waste can be minimised via their work package
- Minimise wastage rates via contractual clauses
- Work with the supply chain to reduce and recover waste
- Assign responsibility to a waste champion who will be present on the site to implement the SWMP
- Use key performance indicators (KPIs) relevant to the industry and project type for monitoring performance
- Set individual targets for waste types
- Monitor, review and ensure continuous improvement.

It is important that at all three levels of the SWMP (standard, good and best practice) are simple and easy to follow, and for each one to clearly outline the procedures for waste management onsite.

Companies that have not yet developed a SWMP should start with a standard practice SWMP then move on to good and best practice SWMPs if required.

Section 3 in this guide provides guidance and templates for standard, good and best practice SWMPs.

TABLE 2

Comparison of site waste management plans: Standard, good and best practice

Activity	Standard	Good	Best
Duty of Care requirements (Environmental Protection Act 1990 [Duty of Care] Regulations 1991)[1.8]			
Documentation showing compliance with legal requirements			
Responsibility for waste management			
One person designated as overall waste champion			
Responsibility for individual areas designated to individuals			
Waste management contractors			
Dialogue to establish opportunities for recycling			
Contractual agreements with high levels of recycling and partnerships			
Trade contractors			
Agreements with trade contractors on how to manage waste			
Contractual agreements with set targets and regular review			
Identification of waste arisings and disposal routes			
Listed in the SWMP before site work commences			
Opportunities for recycling and reuse identified prior to construction			
Waste minimisation included as part of the design, pre-fabrication, etc			
Reuse of materials			
Inert materials			
Concrete, soils and inert materials, on and offsite			
Reuse area onsite for all materials			
Recycling of materials			
Metals and high value materials			
Wood, plasterboard, packaging and inert materials			
Take-back schemes with suppliers for surplus materials and packaging			
Site design, storage and logistics			
Layout and skip location considered at design stage			
Separate containers for hazardous waste			
Containers optimised for segregation with clear labels and signs			
Segregated containers at the workface and use of compacters and balers			
Clearly located and defined storage areas for materials			
Just-in-time delivery, secure storage areas and no double handling			
Training of workforce			
General information on waste in site induction and toolbox talks			
Specific training relating to environmental issues onsite for key staff			
Feedback welcomed with relevant incentives			
Monitoring			
Skip costs monitored and action taken if too high			
Skip costs and volume data from waste management contractor			
Use of auditing tool such as BRE's SMARTWaste[1.10]			
Regular monitoring of volume/tonnage with reviews for action			
Targets			
Targets based on standard industry KPIs			
Targets based on internally developed KPIs			
Periodic review of performance and final review at project level			
Regular review during project and lessons embedded in the company			

Key

	Activity is not required to be carried out
	Activity carried out occasionally or at low level
	Activity carried out consistently on the majority of sites

CASE STUDY 1 Greenwich Millennium Village, London[1.11]

Description of project	Waste reduction measures	Achievements
This project forms part of the redevelopment of the Greenwich Peninsula, and is a joint venture development by Countryside Properties and Taylor Woodrow with English Partnerships. Phase 1a of this project provided 100 apartments; phase 2a provided 88 high-rise units and 98 low-rise units.	Waste champion appointed with support from the project director. Set-up waste reduction target. Used monitoring tools from BRE (Resource Efficiency Centre) to check performance and target specific products and work packages. Made waste minimisation contractually binding through the use of specific contract clauses. Whole supply chain engaged in waste minimisation.	Achieved waste reductions of over 50%, from 50 m^3 per dwelling to 25 m^3 per dwelling. Saving of £150 000 in direct disposal cost, and resulting in a more productive, cleaner, tidier and safer site.

1.7 A step-by-step site waste management plan

This section gives guidance on how to write and implement a SWMP including using templates and guidance notes for each stage of the process. Elements of the SWMP can be implemented based on standard, good or best practice (see section 3). Stages should include:

1.7.1 Writing and implementing the SWMP

1.7.2 Identification of likely waste arisings, types and amounts

1.7.3 Planning for waste management options

1.7.4 Supply, materials procurement and storage of materials

1.7.5 Communication and training

1.7.6 Segregation of materials and waste handling onsite

1.7.7 Monitoring the Duty of Care

1.7.8 Data collection and monitoring

1.7.9 Regular SWMP review

1.7.10 SWMP review recommendations.

1.7.1 Writing and implementing the site waste management plan

Under the Site Waste Management Plans Regulations 2008, it is a legal requirement for a SWMP to be prepared before construction work starts onsite. The Regulations apply to all projects with an estimated project cost of greater than £300 000 and the legal responsibility lies with the client for preparing the SWMP; however, the client may require the designer or principal contractor to write or input into the SWMP. The most appropriate person should be nominated, depending on the stage at which the SWMP is written eg client, designer, principal contactor etc. To achieve the most out of a SWMP it should be written as early as possible, ie at the planning and design stages.

Whoever is responsible for writing the SWMP should have knowledge of waste and resource management issues and the details of the construction programme. Training may be required on how to write the SWMP which should be written in partnership with the wider team. The wider team includes the client, design team, regulatory bodies,

environmental team, trade contractors (especially the demolition contractor) and the supply chain.

If the client or principal contractor have an environmental manager or a head office environmental team, they should provide the appropriate advice and guidance.

Pre-planning stage

At the pre-planning stage (to take account of design and waste minimisation issues to achieve better waste management and associated cost savings), the developer/client should be involved in writing the SWMP to ensure that waste minimisation is considered at an early stage of the project. It is a legal requirement under the Site Waste Management Plans Regulations 2008 to consider waste minimisation and to record decisions that have been taken in relation to the nature of the project, materials and design, to minimise the quantity of waste produced onsite. To gain a credit under The Code for Sustainable Homes, procedures and commitments for reducing waste generated onsite, for key waste types, should be set out clearly.

Tender stage/project inception

During the tender stage, the parties who will be involved in the project should input their waste minimisation proposals into the SWMP. The client/developer may want to ask questions related to the SWMP within their tender documentation. When construction work commences onsite, it is the responsibility of the principal contractor to implement the SWMP. The principal contractor may have to develop and use SWMPs already created by other parties involved in the construction project. Also, information from trade contractors may be required, such as estimated waste arisings.

Methodology

A SWMP will work best if it is embedded into company policy and site procedures eg within existing environmental management or quality systems. The SWMP should be supported by operational level management eg onsite procedures, and have buy-in from the project team including trade and waste management contractors. The SWMP should evolve as the project evolves and be reviewed at appropriate stages. It is important, however, that the SWMP does not involve complicated paperwork or be seen as a burden by the person writing it.

The SWMP should be viewed as common practice onsite and as part of the day-to-day work. Someone onsite should take ownership of its implementation. This could be the site manager or project manager if the site is small, or on bigger and best practice sites an environmental adviser or waste champion should be appointed to undertake these duties.

The appointed person should be able to communicate with, train and motivate staff and have a good knowledge of the construction project and the various parties involved.

On best practice sites, a waste champion should be appointed who can undertake the following duties:

- Increase awareness of the SWMP and engage with the workforce. The SWMP must be communicated to everyone onsite and be accessible as a requirement under the Site Waste Management Plans Regulations 2008
- Monitor waste generation onsite and produce reports
- Monitor the effectiveness of the SWMP
- Engage with the waste management contractor
- Monitor, and possibly enforce, waste segregation onsite
- Encourage suggestions for better waste management onsite.

Smaller sites might not be able to support a waste champion whose key responsibility is dealing with waste management issues. In these circumstances someone working onsite should be appointed as a waste champion and be given appropriate responsibility.

The waste champion should report to the person who has written and owns the SWMP on a regular basis and should have sufficient resources, knowledge and power to implement it.

Regular training of staff and trade contractors should be considered if required. The SWMP could be discussed as part of the pre-meeting process, especially with the trade contractors and waste management contractors.

The principal contractor is legally bound (as far as reasonably practicable) under the Site Waste Management Plans Regulations 2008 to provide details of the SWMP to site staff through the project induction and toolbox talks. Records of trained staff should be kept and training needs and records should be regularly audited.

1.7.2 Identification of likely waste arisings, types and amounts

Waste is defined as 'any substance or object which the producer or the person in possession of it, discards or intends or is required to discard'.[1.2]

Waste can be generated onsite as a result of:

- Changes in design specifications leading to rework
- Material damage due to inappropriate storage and handling of materials
- Lack of recording the material supplied, delivered and used onsite
- Poor communication between the operative and supervisor causing rework to be carried out
- Excess material left over after a project is complete due to over-ordering
- Temporary works surrounding the building
- Offcuts of materials left over during the construction of the building
- Office and canteen waste
- Dumping domestic waste onsite
- Vandalism.

Controlled waste is a term used for waste controlled under the Waste Framework Directive[1.4] and includes any household, industrial or commercial waste. Controlled waste on a construction site usually falls into three categories:

Inert waste – waste materials that will not harm or cause adverse effects to the environment when disposed of, or do not decompose when buried. They have no potentially hazardous content once placed in a landfill eg rocks, concrete, mortar, bricks, blocks and tiles, plaster (not plasterboard), uncontaminated soils and aggregates and glass.

Non-hazardous waste – waste materials that will break down/decompose when buried, resulting in the production of landfill gases such as methane and carbon dioxide eg timber, paper, cardboard, green wastes, food, metal and plastics.

Hazardous waste – waste materials that are harmful to human health or environment eg products liable to cause death, injury or impairment to living beings, pollution of waters or unacceptable environmental impact if improperly contained, handled, treated or disposed of. Hazardous wastes can include products with one or more of the following properties: explosive, oxidising, flammable, highly flammable, irritant, toxic, carcinogenic, corrosive, infectious, teratogenic, mutagenic and ecotoxic.

Waste materials that are always classified as hazardous include:

- Fluorescent tubes and other mercury-containing waste
- Waste oils and acids
- Solvents
- Coal tar and tarred products
- Lead, Ni-Cad and mercury-containing batteries
- Construction materials containing asbestos
- Insulation materials containing asbestos.

Other hazardous materials on construction sites can include certain types of treated timber, paint and paint containers (depending upon how empty they are), mastics and adhesives.

All hazardous waste should be segregated out from other waste streams onsite. This is to avoid the contamination of other wastes which would incur higher removal costs.

The likely waste arisings for the types and amounts of waste should be estimated for each part of the work programme and broken down by work package and relevant trade contractors (see template 1 on p.16); as a minimum the waste types should be defined as inert, non-hazardous and hazardous. This will help in terms of estimating what types of containers/skips are required for the stages of the project and when segregation would be best implemented for various waste streams. It will also help in determining the costs of removing waste for a project. For example, concrete waste may need a larger container compared with cardboard and plastic wastes. The use of balers and other systems such as compaction may need to be considered in the SWMP. Compaction is particularly important as void space in skips can be up to 40%.

Waste arisings from demolition and enabling works should be included in the estimate; this is dependent upon the types of building on the site and the materials/components within them. The type and amount of demolition waste can be estimated from carrying out a pre-demolition audit and/or implementing the ICE Demolition Protocol.[1.12] For more sources of information see Box 2 on p.17.

CASE STUDY 2 Luxury housing development, Langley Park, Beckenham[1.11]

Description of project	Waste reducing measures	Achievements
Langley Park in Beckenham is one of Laing Homes' largest housing developments. This project included the demolition of the former industrial buildings and the construction of 75 luxury houses and flats.	Contractual controls. Waste amounts recorded and different waste streams kept separate. Reuse of materials from demolition. Use of standard dimensions to reduce potential for waste. Efficient storage of reusable products, eg timber pallets.	Total cost savings of £525 000 (3.5% of project costs). Recovery of 500 000 roofing tiles (demolition building) for reuse. Reuse of 40 000 tonnes of demolition spoil as sub-base. Waste disposal costs reduced by £600/housing unit.

TEMPLATE 1 Estimated waste arisings CD

Work package	Type of waste (tonnes or m^3)														
	Ceramics	Concrete	Hazardous	Inert	Insulation	Liquids (litres)	Metals	Office and canteen	Packaging	Plaster-board	Plastic	Timber	Trade contractors	Vegetation	Misc.
Demolition	100	1000	20	1000	N/A	N/A	50	N/A	N/A	10	10	10	Demolition	N/A	N/A
Drainage													Groundworks		
Earthworks			20	2000									Earthworks, demolition and landscaping	300	
Envelope													Cladding, brick and blockwork		
Fit-out										50			Dry lining and joinery		
Frame: concrete, timber and steel		1000								N/A			Concrete frame, groundworks and piling		
Glazing	N/A	N/A	10	100	N/A		N/A	N/A	N/A	N/A	N/A	N/A	Demolition		
Hard landscape													Groundworks		
Mechanical and Electrical Engineering (M&E)													M&E		
Piling													Groundworks		
Roofing													Decking and roofing		
Site clearance	100	N/A	N/A	100	N/A	N/A	N/A	40	30	N/A	10	N/A	Landscaping and logistics	200	100
Soft landscape													Landscaping		

CASE STUDY 3 The Childwall Housing Project, Liverpool[1.13]

Description of project	Waste reduction measures	Achievements
The project involved the demolition of seven high-rise blocks and one maisonette block replaced with 157 new homes and a community facility, at a total cost of £13.6 million. Liverpool Housing Action Trust and Sustainability Northwest involved several trade contractors and advisers in order to incorporate good waste management into the project.	Using pre-fabricated timber frames to minimise onsite waste. Commissioning a predevelopment waste reclamation audit for recommendations on reuse, reclamation and recycling. Formally discussing demolition disposal with contractors to ensure that disposal routes were environmentally responsible. Where possible, reclaiming demolition materials for the build and using recycled materials from other sites. Providing residents with domestic waste segregation facilities.	Ninety per cent of demolition materials were reused or recycled during construction, saving time and money. Reduced domestic waste which made sense to pass along the cost benefits of good waste management.

BOX 2

Where to find out more – Demolition and refurbishment waste

BRE

BRE offers pre-demolition and pre-refurbishment audits which quantify the products/materials within the building and recommend recovery routes including reuse on and offsite, recycling and disposal based on location and cost: www.smartwaste.co.uk/predem.jsp.

ICE Demolition Protocol

The ICE Demolition Protocol has been written to provide a methodology for achieving resource efficiency within demolition projects: www.aggregain.org.uk/demolition/the_ice_demolition_protocol/index.html.

WRAP

WRAP has a step-by-step approach that links demolition and recycled content to the SWMP: www.wrap.org.uk/construction.

Wastes can be produced at various stages of the project:

- Inert wastes such as concrete, bricks and blocks will be generated in the first phases of the project
- Timber waste may be generated throughout the whole project
- Plastic waste will tend to increase as the project progresses
- Packaging waste will increase as the project progresses and may be up to 35% by volume during the fit-out stages
- Certain types of waste will be present throughout all stages of the project eg office and canteen waste.

The SWMP should include an estimate of the quantities of waste throughout the project to assist in prioritising key wastes. The estimate is useful when negotiating waste management contracts due to the economies of scale. It may also be possible to broker 'wastes' to another site requiring material eg crushed concrete. Data can be collected in either volumes (m^3) or tonnages. Template 1 can be used to record waste arisings.

1.7.3 Planning for waste management options

Various waste options must be considered in advance for the estimated waste arisings onsite. The options should follow the waste hierarchy (see Figure 1):

- Consider reducing waste
- For waste arisings plan for reuse and recycling opportunities (on and offsite)
- Recovery options eg energy recovery and finally disposal to landfill.

It may be useful to talk to the waste management contractor to find out their options for waste once it is removed offsite. Planning for waste management will provide important information for planning the project if any specialised equipment is required eg a mobile crusher for recycling aggregates, provide advanced warning if exemptions or licences are required and plan for the appropriate use of space and containers.

In terms of waste minimisation, planning will also support any discussions with the design team and client. For example, if ceiling heights are designed to correspond with board heights, there should be a reduction in offcuts, particularly for partition walls where boards can be ordered in bulk and cut from floor to ceiling height. Good onsite storage, improving the method of working and employing a skilled labour force should also minimise the amount of waste produced.

By putting the above points into practice, proposed targets for waste generation, segregation onsite, recycling of materials and diversion of waste from landfill can be planned and executed. The Code for Sustainable Homes requires at least three waste groups to have waste reduction actions at the design stage for the additional credit; and at least three waste groups to be diverted from landfill for another credit. Template 2 is an example of a planning template suitable for use by a large construction company, which can be part of a SWMP.

TEMPLATE 2 Planning for site waste management CD

Waste material	Waste package	Estimated quantity		Site waste management plan			
		Volume (m^3)	Mass (t)	Waste minimisation opportunities (pre-fabrication, material selection etc)	Onsite recycling/reuse/ segregation (specify method and use and if waste processing licence or exemption held)	Offsite recycling/reuse (specify recycler and recycling outlet)	Disposal (location) (if no other option)
Canteen	Canteen and logistics			Use reusable cutlery and crockery	Compost for landscaping Must be kept separate from other waste and stored in wheelie bins with lids	Send for composting (food waste only), segregate paper, cans and glass	Landfill
Concrete	Demolition, piling, concrete frame and groundworks and floors			Pre-fabrication offsite, onsite batcher and plan pours (use surplus for blinding etc)	Excess material can be dried and reused as backfill and segregate	Segregate, land reclamation, reprocessed and reused in the construction industry	Landfill
Fixtures and fittings	Fit-out			Sell to a second hand furniture dealer	Reuse in temporary office facilities	Segregate at transfer station	Landfill
Glass	Demolition					Segregate waste and send for recycling	Landfill
Hazardous waste (asbestos)	Demolition, strip out			N/A	N/A	N/A	Landfill
Hazardous waste (contaminated land)	Earthworks and groundworks			Contain in situ	Remediate onsite and reuse materiall	Remediate offsite	Landfill
Hazardous waste (paint tins, mastic etc)	All trades			Use solvent-free paints that are not disposed of as hazardous waste. Maximise use of mechanical fitting rather than adhesives	Use a separate, secure, covered container for storage	Incinerator	Landfill
Hazardous waste (other)							
Metal	Temporary works, steel frame, concrete frame and decking			Pre-fabrication, correct ordering, store correctly	Reused in temporary works	Segregate waste and send to scrap merchant	Landfill
Mixed waste	All trades			Pre-assembly and pre-fabrication offsite		Send to transfer station for further segregation	Landfill

Waste material	Waste package	Estimated quantity		Site waste management plan			
		Volume (m^3)	Mass (t)	Waste minimisation opportunities (pre-fabrication, material selection etc)	Onsite recycling/reuse/ segregation (specify method and use and if waste processing licence or exemption held)	Offsite recycling/reuse (specify recycler and recycling outlet)	Disposal (location) (if no other option)
Office waste	Management and major packages			Photocopies are double sided. Instead of reissuing a whole document, only issue the relevant pages. Only use non-disposable cups	Reuse paper, cartridges, plastic cups, newspaper, magazines, tins and cardboard	Segregate and recycle white paper	Landfill
Packaging	M&E, fit-out and cladding			Request minimal packaging and suppliers to take back their packaging		Segregate cardboard, pallets and plastic for recycling	Landfill
Pallets	Cladding, brick and blockwork			Return pallets to supplier or use plastic pallets	Reuse pallets for internal storage and movements of materials	Segregate and chip pallets for compost or furniture. Send for reuse	Landfill
Plasterboard	Dry lining			Procure to uniform size, store flat, undercover in a secure compound	Dedicated storage place for offcuts to reuse	Send back to a plasterboard recycling facility	Landfill
Rubble (hard core)	Demolition, brick and blockwork			Using part of existing structure in original form within completed construction	Use as hardcore onsite	Segregate, land reclamation, reprocessed and reused in the construction industry	Landfill
Sub-soil	Piling, groundworks and earthworks			Store onsite	Reuse in landscaping, use as backfill	Land reclamation	Landfill
Timber	All trades			Use steel shuttering, reuse all shuttering, use another product	Reuse for shuttering and general carpentry (steps etc)	Segregate, chip for composting or furniture manufacture	Landfill/incinerate
Topsoil	Concrete frame groundworks, joinery			Store onsite turn regularly	Reuse in landscaping	Sell topsoil, land reclamation	Landfill
Vegetation	Earthworks			Excavate and replant larger specimens (trees)	Chip onsite, compost, for landscaping	Segregate, send for composting and/or spread on land (improvement)	Landfill
Other	Earthworks, demolition						

1.7.4 Supply, materials procurement and storage of materials

Supply

It is important to review how materials are procured and transported to site. Companies generally include costs for waste produced through damage, vandalism etc. However, most waste could be reduced by 1 to 2% without having a knock-on effect on the construction programme. Over-ordering of materials can also lead to unnecessary waste.

Wastage rates for materials could be reduced through better ordering systems, less packaging and take-back schemes. This requires the supply chain to engage with the SWMP process and for an understanding of how much material is being procured, how much is used and how much is subsequently wasted.

Materials procurement

When ordering materials always consider these points:

- It is essential to calculate correctly and order the amount of materials required for the job. Ask yourself "Is an order of 110% really necessary?"
- Order in standard sizes. For example, can plasterboard be cut to size offsite to minimise onsite cutting and waste?
- Purchase materials that have a recycled content or are reclaimed
- Procure sustainable materials such as those recommended by BRE's environmental profiles – *The green guide to specification*[1.14] and the *National green specification*.[1.15] Procure timber from legal and well managed sources such as those endorsed by the Forestry Stewardship Council (FSC)
- Try to seek out alternatives to hazardous products to protect the environment and reduce the cost for hazardous waste disposal
- Ask suppliers to minimise packaging and to guarantee a take-back service, especially for pallets
- Get the materials delivered to site just-in-time so the standing time for these materials is reduced, and make use of consolidation centres
- Schedule the deliveries of materials to site
- Always count the number of items ordered. Incomplete deliveries or damaged goods should be returned to suppliers at the time of delivery.

Storage

It pays to appoint a person to be in charge of, and manage, storage. If it is possible, set-up a central storage area where the correct amount of materials can be issued for the job and unused products can be returned to. Materials often enter skips as a result of bad storage, wet weather conditions and humidity which may spoil them – this can happen especially with plaster and cement. It is essential to store materials carefully onsite and out of the way of site traffic. Improved material handling onsite can have a big impact on the reduction of waste. Template 3 (p.22) can be used to record storage of materials.

Box 3 on page 23 provides more information on supply, materials procurement and storage of materials.

TEMPLATE 3 Storing raw materials delivered to the site CD

Waste material	Storage under cover	Storage in a secure place	Storage on pallets	Storage in bundles	Special requirements
Asphalt sheeting/ roofing felt	✔	✔			Store in rolls and protect with polythene
Bricks and blocks			✔	✔	Store in original packaging until use. Protect from vehicular traffic
Ceramic and concrete piping			✔	✔	Use separators to prevent rolling Store in original packaging until they need to be used
Ceramic and slate roofing tiles		✔	✔	✔	Store in original packaging until used
Ceramic tiles	✔	✔			Store in original packaging until ready for use
Curbing				✔	Protect from vehicular traffic and avoid spraying by tar
Flat glass and other		✔	✔		Protect glass from breakage caused by poor handling or site traffic
Glass fibre material	✔			✔	Store in original packaging until ready for use
Hardware items	✔	✔			
Insulation panels	✔	✔			Store in polythene wrap
Metals	✔	✔			Store in original packaging until it needs to be used
Mortar		✔			Protect from drying out Only mix/order what is needed for the job on the day
Oil		✔			Store in trucks, tanks or cans depending on the amount of oil Use double skinned containers and protect them from damage to reduce risks of spill
Paint		✔			Lock away in a COSSH bunded storage cage with air circulation
Plaster and cement	✔		✔		Avoid dampness
Pre-fabricated concrete items				✔	Store in original packaging away from vehicular traffic
Sand and gravel					Store on solid base to reduce losses
Solvents		✔			Lock away in a COSHH bunded storage cage with air circulation
Timber	✔	✔			Protect all types of timber from rain
Topsoil and rocks					Store on solid base to reduce losses Keep away from potential pollutants
Wall tiles	✔	✔			Wrap in polythene to prevent scratching
Wet concrete		✔			Protect from drying out Only mix/order what is needed for the job on the day

CASE STUDY 4 Housing development, Kingswells, Aberdeen[1.16]

Description of project	Waste reduction measures	Achievements
This waste minimisation project at Kingswells, Aberdeen, built a variety of detached houses to designs developed by Stewart Milne Homes.	Implemented an onsite just-in-time delivery system. The precise quantities of electrical and plumbing fittings were pre-packed and delivered to each plot at exactly the right time. The correct quantity of bricks and roof tiles was delivered to each plot.	Almost complete elimination of waste in electrical fittings, wiring, plumbing, pipework, blockwork and tiling. A reduction in material costs of 10.7%.

BOX 3

Where to find out more – Supply, materials procurement and storage of materials

AggRegain

WRAP's free sustainable aggregates information service. It is designed to assist anyone interested in producing, specifying, purchasing or supplying recycled or secondary aggregates: www.aggregain.org.uk.

BRE's Environmental profiles

A certificated life cycle assessment scheme for construction products: www.bre.co.uk/page.jsp?id=53.

BRE's *Green guide to specification for housing*

A scoring system for building specifications for housing based on life cycle assessment: www.bre.co.uk/greenguide/page.jsp?id=499.[1.17]

CIRIA

Guidance on managing materials and components onsite (SP146): www.ciria.org.

London Remade

Sustainable products directory and information on recycled products: www.londonremade.com.

National green specification

An internet-based resource for all building designers, constructors and manufacturers involved with sustainable construction: www.greenspec.co.uk.

Recycled Building Products Network

This network has been set-up to encourage greater use of recycled material in construction product manufacture and stimulate demand for recycled building products: www.bre.co.uk/ rbp/page.jsp?id=1.

Recycled Products Finder

UK directory of recycled products: www.recycledproducts.org.uk.

SALVO

Information on reclaimed building materials and architectural products: www.salvoweb.com.

WRAP

Information on procuring materials with a recycled content for use in construction: www.wrap.org.uk/construction.

1.7.5 Communication and training

The success of implementing the SWMP depends on communicating it to site staff. Different styles of communication need to be employed depending upon the level of knowledge required.

Communication and training can include:

- Introducing the SWMP as part of the induction process: this can be built in as part of the health and safety requirements onsite
- The use of toolbox talks onsite on waste management and SWMPs. Ideally these toolbox talks will be specific to the site and given to site operatives. Supervisors could be given 'a train the trainer' package and be responsible for the delivery of toolbox talks. This could be part of their contractual obligations
- Higher-level workshops for the project team to identify progress on the SWMP and its implementation
- Site set-up meetings at the early stages of the project with the waste contractor, site manager and client
- The use of posters onsite to raise awareness and keep waste 'on the agenda'. Poster topics can include a graphical representation of waste produced onsite, procedures, figures on how much waste has been recycled, diverted from landfill etc
- Newsletters to update site staff.

There are many informal ways of communication that can be used. For example, a suggestion scheme could be implemented for better waste management with the appropriate rewards for good suggestions eg vouchers, free breakfasts, etc. See Box 4 for sources of information on training.

CASE STUDY 5 The Whitefriars Project, Coventry[1.13]

Description of project	Waste reduction measures	Achievements
The project is a five-year programme of improvement works to some 10 000 occupied homes. It encompasses refurbishments to internal elements (such as kitchens, bathrooms, floors, heating and wiring), externals (such as roofs and walls) and environmental features (fencing and communal areas).	Wates (the principal contractor) employed a raft of waste management activities at Whitefriars including: - Defining a thorough waste management strategy from the outset, including just-in-time deliveries to minimise unnecessary onsite material storage. - Developing a segregation and recycling system with a waste removal company to virtually eliminate the need for onsite skips. - Investing in training of apprentices, and developing multi-skilled teams to provide long-term efficiencies. - Engaging with residents to ensure the smooth running of the project Tender reductions of 5% achieved on the project.	A thorough waste management programme resulted in approximately 850 tonnes of material being diverted from landfill. Resident engagement activities led to an 86% resident satisfaction rating. Reduced materials storage and handling contributed to a noticeable difference in the number of onsite incidents.

BOX 4

Where to find out more – Training

Carillion

Site toolbox talks 'Everything from bats to wild parsnips' is available from: www.carillionplc.com/sustain-2002/Z.Toolbox%20Talks.htm.

Construction Employers Federation

Manual for a whole variety of toolbox talks: www.cefni.co.uk/pdf/Whole_Manual_doc.pdf.

Envirowise

Environmental information fact sheets for various trades including decorators, labourers, carpenters and bricklayers: www.envirowise.gov.uk/212463.

Health and Safety Executive

Toolbox talk on 'watch your step, related to slips and trips': www.hse.gov.uk/construction/slips.

Project SusD

Downloadable tools and guidance for training and creating partnerships including induction and tool box talks: www.projectbuild.org.uk/Project_Susd/index.htm.

SEPA (Scotland)

Guide available: *The small environmental guide for construction workers.* www.sepa.org.uk/pdf/publications/leaflets/wastemin/env_guide_cons_workers.pdf.

Waste Aware Construction

Links to various toolbox talks on waste: www.wasteawareconstruction.org.uk/toolbox.asp.

1.7.6 Segregation of materials and waste handling onsite

Where possible waste material should be segregated onsite. This will achieve cost savings as container prices for segregated materials are usually lower than for mixed skips as it aids recycling. In order to achieve effective segregation of waste materials onsite, the following should be considered:

- Clear labelling and signage for containers: a national colour-coding scheme has been set-up by the ICE and WasteAware Construction. More information can be found on: www.wascot.org.uk/construction/index.asp. WRAP has also produced information on segregating waste materials (see Box 6).
- Appropriate locations and designated areas for containers. Space for segregation needs to be considered when planning the project
- Appropriate use of containers eg the use of satellite bins at the workface which can then be transported to larger containers
- Emptying containers on a regular basis to prevent lack of space and possible contamination
- Clear procedures for waste segregation communicated to site staff
- Training to site staff via toolbox talks and induction
- Publicity of the segregation scheme to site staff eg by using information posters
- Enforcement of the segregation scheme by appropriate staff eg the waste champion and appropriate monitoring eg spot checks
- The use of incentives/penalties and a suggestion scheme.

The most important aspect of onsite material segregation and waste management is to have commitment from all site staff. Encourage buy-in at the start of the project by offering training in segregation skills to all site staff. Explain the importance of segregation and recycling in terms of financial and business benefit. It is good practice to ensure that trade contractors are responsible for the segregation of their waste onsite, instead of leaving the entire responsibility to the principal contractor. Trade contractors should be encouraged to

segregate the waste they produce. Issues to consider include putting time and labour aside each day to segregate and manage their own waste, and providing drip trays for mobile plant and mechanisms to dispose of wastewater for example.

Some projects require trade contractors to participate through contractual obligations, or even to be responsible for paying for the removal of the waste they produce, via charging back or other financial mechanisms. Setting up contractual agreement can be initiated by the principal contractor. For example, trade contractors were contractually obliged to segregate their waste at the Greenwich Millennium Village site, which achieved savings of £4000 for the first phases of the project as a result of this action alone (see case study 1).

Make waste management easy

Before embarking on waste segregation, it is advisable to discuss the suitable options for separation with the waste management contractor who will collect the waste from the site. Knowing how the waste should be sorted, stored and collected from the site will help with managing it. Once this has been identified, assign labels to the skips/containers to ensure that the correct materials are placed inside it. Use lockable skips in order to avoid contamination. Ensure easy access to the skips so operatives do not have to walk long distances to the segregation skips/containers. Arrange periodic removal of the segregated materials from the site.

If there is a lack of space to achieve segregation onsite, the project team should work closely with the waste management contractor to ensure that the mixed waste containers used are sorted for recycling at a waste facility. This should achieve high rates of recovery.

Also, it is important to show an audit trail of the waste's movement from the site to its final destination by auditing the waste management contractor periodically.

Monitor progress

Periodic audits of the skips allocated for segregation should be carried out to ensure compliance and to check that segregated material skips are not contaminated with mixed waste or inappropriate materials. If the skip is contaminated, try to find out by whom and retrain site staff if necessary.

Consider using software tools to track the quantities of segregated waste created by the project. Waste monitoring systems such as SMARTWaste (developed by BRE) can help to monitor the volume of waste generation and benchmark waste generation against other projects.[1.10]

CASE STUDY 6 Townmead Estate, Wandsworth, London[1.13]

Description of project	Waste reduction measures	Achievements
Demolition of residential flats and construction of five multi-storey blocks for mixed use.	Onsite logistics manager responsible for co-ordinating waste management. Used wheelie bins in key areas for bulking up. Induction training and toolbox talks. Recycled demolition waste onsite.	Target of less than 20% of waste sent to landfill. Saved £5000 by using recycled waste onsite.

Managing specific types of waste

Guidance is provided below for waste materials created onsite. See Box 5 for more information on waste exemptions management.

Topsoil, concrete and bricks

Topsoil is an organic layer of soil which sustains vegetation. Therefore, it is a delicate but useful material. An attempt should be made to use it as soon possible after it has been

dug up. It should be stored carefully so that it can be reused onsite for landscaping purposes at the end of the project. If it is not possible to reuse topsoil on the project, check if there is a nearby site location that could reuse it. Waste exemptions may be required.

Topsoil should be stored effectively to eliminate contamination from other wastes. Set aside a place exclusively for storing soils, making piles of less than two metres in height (if it is higher than this the pressure on the soil may damage its structure). Soils should be kept as dry as possible.

Concrete from the site that is free from contamination can be recycled as aggregate for the production of new concrete as sub-fill material or material for temporary roads. This means that for every tonne of concrete recycled, a tonne of virgin materials excavated would be saved. Crushed bricks and concrete can be also used for landscaping purposes onsite.

Depending on the quantity of bricks and concrete present on the job it may be cost-effective to hire a concrete crusher to crush these materials onsite. Alternatively, it may be possible to reuse bricks onsite depending on their condition – check with the regulator to see if a waste management licence for the crusher is required. There are various types of crushers for concrete and bricks that produce materials with different characteristics. It is necessary to calculate the volume of materials generated and the amount required for the new construction. According to these calculations, it can be decided if onsite or offsite recycling is the most cost-effective.

If these materials are required to be sent to the waste transfer station/recycling facility, check how far the site is to the facility and that it accepts these materials. In order to increase the recycling possibilities, concrete should be separated from the bricks as concrete is a higher grade product which could be used as recycled concrete aggregate in the production of new concrete. Refer to the *Quality protocol for aggregates from inert waste* (www.aggregain.org.uk/quality/quality_protocols/index.html) for more information. If mixed with bricks or other materials, it may be used for lower grade recycled aggregates. Do not mix concrete materials with plaster or plasterboard waste because the sulphate content of these materials makes them unusable as raw materials for new concrete.

Asphalt and bitumen

Asphalt and bitumen can be recycled onsite or offsite using cold or hot processes. Asphalt mix can be used in various applications, such as repaving, road edges and filling up potholes. Segregate and store the asphalt separately from other materials. When asphalt is torn up from road surfaces the top layer should remain separate from lower layers in which other materials are mixed.

CASE STUDY 7 Residential flats, Comely Green Place, Edinburgh[1.11]

Description of project	Waste reduction measures	Achievements
Wren and Bell managed a £4.5 million sustainable housing project in Edinburgh that consisted of 95 residential flats.	Reused materials onsite where possible. Regular site audits to monitor use and wastage of materials. Less offcuts by using standard dimensions.	Bricks, blocks and timber waste kept below 1.5% (the industry 'norm' is often over 5 to 10%). Waste disposal cost £19 000 (0.42% of the project cost). The full cost of waste was £200 000 ('norm' probably £600 000).

BOX 5

Where to find out more – Waste management licensing

Waste management licences or exemptions may be required for the following reasons:

- The waste is deposited
- The waste is kept, ie stored waste that the site did not produce
- The waste is treated, including recycling and using mobile plant
- The waste is disposed of.

Whether a licence or an exemption is required depends on the:

- duration of storage
- types and quantities of wastes that you are handling
- the activity carried out onsite.

Most activities onsite will fall under simple exemptions. These exemptions can now be registered very easily either by phone or by completing a simple form provided then sent to the Environment Agency. Complex exemptions should be assessed before registration.

Common exemptions include:

- Paragraph 9A Exemption – Land improvement and reclamation
- Paragraph 13 Exemption – Manufacture and treatment of waste
- Paragraph 17 Exemption – Storage of waste in a secure place
- Paragraph 19A Exemption – Storage and use of building waste (complex exemption)
- Paragraph 26 Exemption – Recovery of waste as integral part of the process.

Crushing plants should have the following licences:

- Part B permit from the local authority in England and Wales
- Part C permit from the local authority in Northern Ireland
- Part B permit from SEPA in Scotland.

For more information go to: www.netregs.gov.uk.

Timber

Untreated timber can be recovered from most demolition, refurbishment and new build projects. There are various opportunities for turning timber wastes into value from direct reuse to recycling for chipboard, mulch etc. In order to reuse timber, it is essential to set-up a proper storage area onsite: pallets can be reused, collected or sent back to the suppliers. Construction timber is usually treated with products and in the case of chipboard, plywood and MDF, glue is used in the manufacturing process. Currently it is very difficult to recycle these products and most timber recycling companies will not accept these types of timber panel-based wastes.

The presence of metal in the timber (eg nails, screws and staples) makes it more difficult to recover because these items are difficult to pull out and may end up damaging the recycling machinery. Before deciding the timber segregation practices onsite it is advisable to contact the waste management company to see what type of timber products they are able to take.

It may be possible to place uncontaminated plywood with general timber offcuts.

Metals

Metallic wastes are the easiest to recycle because they are of considerable value. To facilitate the recycling of metals, they need to be stored separately from other wastes. This selective separation should be carried further with a breakdown into various kinds of metals.

Non-ferrous metals such as copper fetch a much higher value than ferrous metals. For example, a tonne of copper or aluminium can be sold to a metal reprocessor for £400. Ferrous metals such as cast iron or galvanised metals have a lower value eg £30 to £60 per tonne.

Plastics

Plastics provide various possibilities to turn waste into value. However, it is not always easy to recycle plastic from the construction sector as the quantities can be small and spread across a wide area and they are often in poor condition (ie presence of other

wastes such as soil). The fact that there are so many types of plastic does not help in the segregation of this material at site level. As many plastic products can be of high volume but low in weight it may be worthwhile investigating the use of compactors and balers.

Plasterboard

Plasterboard is classed as a non-hazardous waste and should only be disposed of in non-hazardous waste landfill sites in specially constructed cells where no biodegradable waste is accepted. Only one landfill site (in Humberside) currently accepts plasterboard waste in a monocell, which is publicly available.

However, when plasterboard is mixed in with other waste it can be deposited in a non-specific cell, as long as it is less than 10% by weight.

Plasterboard should be segregated onsite. Plasterboard waste will usually be generated by the dry lining trade contractor onsite. All plasterboard manufacturers now offer a take-back scheme for plasterboard waste resulting from new construction.

Other materials

Other materials that can be recycled include windows and packaging. For more information, see Box 6.

BOX 6

Where to find out more – Reuse and recycling of materials (source: WRAP)

AggRegain

WRAP has developed this website to provide information, guidance and tools on applications of recycled and secondary aggregates: www.aggregain.org.uk.

BREMAP

A free geographical information system listing various waste management facilities – searchable by location and postcode: www.bremap.co.uk.

CIRIA

A database of construction-related recycling sites: www.ciria.org/recycling.

NISP

A business-led initiative which facilitates links between industries from different sectors to create sustainable commercial opportunities and improve resource efficiency: www.nisp.org.uk.

Packaging

Guide for minimising and managing packaging waste from construction sites: www.envirowise.gov.uk/gg606.

Plasterboard

Guidance on depositing plasterboard waste: www.netregs.gov.uk.

WRAP has a programme on plasterboard waste encouraging better management of it. www.wrap.org.uk/construction/plasterboard/index.html.

Recovinyl

Provides financial incentives to support the collection of PVC waste from construction and demolition sectors: www.recovinyl.com.

Recyclewood

An internet source showing locations of wood recyclers sponsored by WRAP: www.recyclewood.org.uk.

SALVO

Provides information on the reclamation sector, architectural salvage; suppliers/dealers of materials and a materials information exchange: www.salvoweb.com.

Windows

Guide to recycling windows waste: www.wrap.org.uk/downloads/FlatGlassGoodPracticeGuide.49212f18.pdf.

WRAP

'How to' guides for recycling of construction waste materials and other information and guidance: www.wrap.org.uk.

1.7.7 Monitoring the Duty of Care

A SWMP should provide all the information for the site to comply with Duty of Care requirements (Environmental Protection Act 1990 (Duty of Care) Regulations 1991)[1.8] and any other environmental legislation when dealing with waste produced onsite (see Box 7 on p.32).

Companies are required to ensure that any waste produced is handled safely and legally. It applies to anyone who produces, imports, transports, stores, treats or disposes of controlled waste from business or industry. Commercial, industrial and household wastes (including hazardous wastes) are classified as controlled waste. The Duty of Care requirements also apply to anyone who acts as a waste broker. Companies must check that contractors dealing with their waste are authorised to remove it. If a company does not check authorisation, and the waste is illegally disposed of, the company could be held responsible. Companies that have waste passed on to them include:

- Waste contractors
- Scrap metal merchants
- Recycling companies
- Local councils
- Skip hire companies.

Waste is defined as 'any substance or object which the producer or the person in possession of it, discards or intends or is required to discard'.[1.4] Each substance or object should be determined using the following criteria: Has the substance or object been discarded so that is no longer in the commercial cycle? If the answer is yes, it can be classed as waste. A substance or object, which is waste at the point of its initial production, must be regarded as waste until it is recovered or disposed of. To ensure legal compliance, the following stages must be adhered to when dealing with any waste:

- Identify the waste
- Keep the waste safely
- Describe the waste to the carrier
- Transfer the waste to an authorised person/company
- Check the registration of the waste carrier.

Identify the waste

A substance or object becomes waste once there is no further use for it in its present condition. Once the substance or object becomes waste then it must be stored safely prior to removal from the site.

Keep the waste safely

All waste producers must ensure that waste is stored properly onsite including:

- Ensuring that there is no accidental spillages, leaks or leaching from waste unprotected from rain
- Preventing accidents or weather breaking open containers thereby allowing waste to escape
- Preventing waste escaping during storage and transport
- Preventing scavenging of waste by animals or thieves
- Preventing the bringing of household waste onto site
- Using colour coded skips for segregating materials to be sent for recycling
- Providing training to site operatives in order to use the skips sufficiently and appropriately.

Describe the waste to the carrier

A waste transfer note (WTN) for general waste, and a consignment note (CN) for hazardous waste must be completed, signed and kept by all the parties involved.

- WTNs must be kept for two years
- CNs must be kept for three years. If a site is producing over 200 kg of hazardous waste (which the majority of construction sites will), the site will have to register as a producer of hazardous waste. This can be done through the Environment Agency.

The WTN must also include the combination of the following:

- The quantity and type of waste transferred (using the appropriate codes in the List of Wastes (England) Regulations 2005[1.18] and the List of Wastes (Wales) Regulations 2005)[1.19]
- How it is contained
- The name of the site the waste comes from
- The process that produced the waste
- The site the waste is being taken to
- Signature of waste champion.

Transfer waste to an authorised person/company

Waste must only be transferred to an authorised person or company. A list of authorised persons/companies are:

- A registered waste carrier
- Exempt from waste carrier registration
- A waste management contractor licensed to accept the waste
- Exempt from waste management licensing
- A waste collection authority.

Check the registration of the waste carrier

Before transferring waste to the waste carrier ensure that they have a valid certificate of registration or are exempt from registration.

- The original certificate of registration should be viewed, copied and kept on file
- A copy of the certificate can be obtained from the Environment Agency
- The Environment Agency and SEPA's public register of carriers can be checked for registered carriers.

Wastes that have been produced must be classified according to how they are produced. Common codes are listed in Table 3.

TABLE 3

Common codes for classification of waste

Code	Description
15 01 01	Cardboard and packaging
17 01 01	Concrete
17 01 02	Bricks
17 01 07	Mixed concrete, bricks, tiles, and ceramics
17 02 01	Wood
17 02 03	Plastic
17 04 05	Iron and steel
17 04 07	Mixed metals
17 05 04	Soil and stones
17 06 04	Insulation
17 08 02	Gypsum
20 01 01	Paper and cardboard
20 03 01	Mixed office waste
20 01 08	Biodegradable kitchen waste

BOX 7

Where to find out more – Environmental legislation

Department of Environment Northern Ireland

Regulator for waste legislation in Northern Ireland: www.doeni.gov.uk.

Environment Agency

Regulator for waste legislation in England and Wales: www.environmentagency.gov.uk.

Public registers with information on licensed waste carriers, brokers and sites: www2.environment-agency.gov.uk/epr/search.asp.

HAZRED

HAZRED is a three-year project co-funded by the EU Life-Environment programme, which aims to help small and medium sized enterprises prevent and reduce their production of hazardous wastes, and reducing costs: www.hazred.org.uk.

NetRegs

Guidance on how to comply with environmental law as well as advice on good environmental practice. The comprehensive section on construction provides advice and guidance on hundreds of activities: www.netregs.gov.uk.

Scottish Environment Protection Agency (SEPA)

Regulator for waste legislation in Scotland: www.sepa.org.uk/guidance.

List of registered carriers, brokers and professional collectors and transporters: www.sepa.org.uk/regulation/rocas/search/index.aspx.

1.7.8 Data collection and monitoring

Types of data

Different types of data can be collected on the waste generated from the project including the following:

- Type of waste generated onsite
- Amount of waste generated onsite
- Segregation rates
- Reuse onsite and offsite, recycling rates and diversion of waste from landfill
- Wastage rates of different materials
- Costs and savings
- Waste movements
- Sources of waste
- Waste profile over course of project
- Levels of damaged materials.

Waste data can be provided by the waste management contractor or waste broker – it is useful to specify this as part of the contract. This type of data will usually include information on the type of waste generated (broken down by list of waste codes), tonnages generated and waste recycled. However, figures given for recycling are usually for the waste facility overall and not per construction site.

Onsite contractors (principal and trade contractors) can use their own systems, or systems such as BRE's SMARTWaste Plan,[1.10] to record the type and amount of waste generated (in volume or tonnes) (Figure 2). Contractors can also analyse the information on WTNs (if this is not done by the waste management contractor). If trade contractors are responsible for the waste, it is important to ensure that this information is captured within the SWMP.

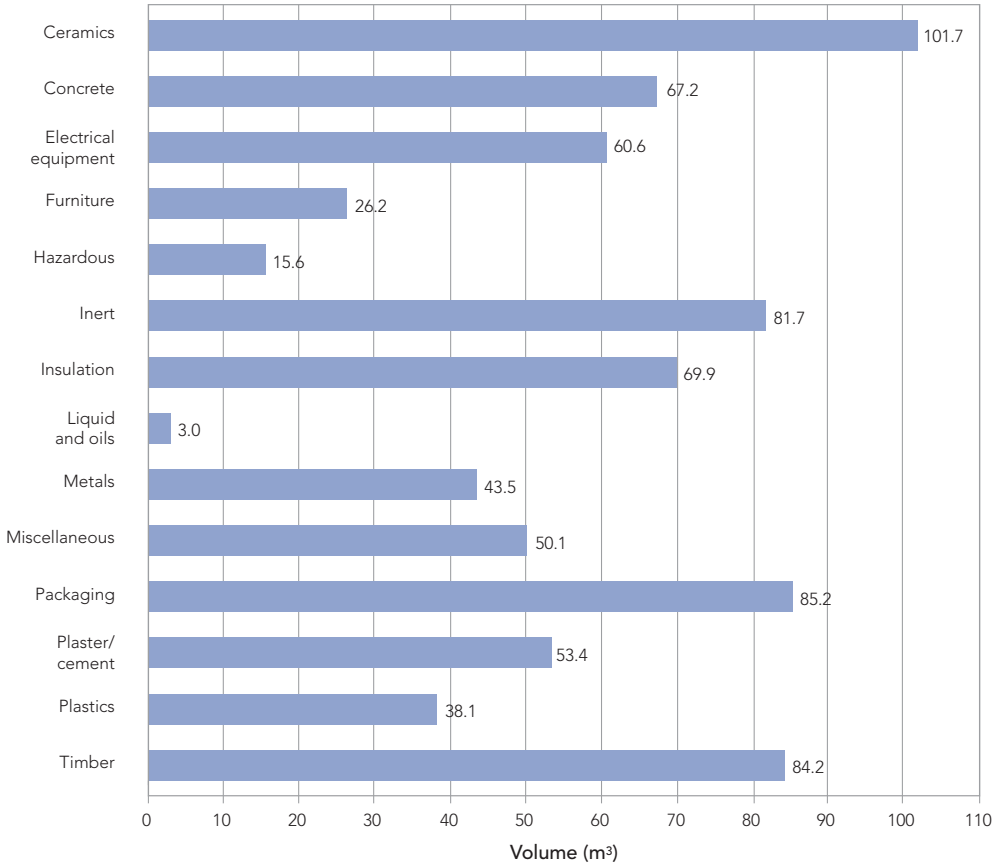

Figure 2 Composition of waste generated onsite (chart volumes do not include void space).

Any data that is collected on waste should be analysed and if possible, realistic targets should be set within the SWMP.

Key performance indicators, benchmarks and targets

Data can be compared across sites, company wide, against previous projects and national averages. KPIs can also be used – the two most common KPIs are:

- Volume of waste (m^3)/£100 000 of project value
- Volume of waste (m^3)/100 m^2 of project floor area.

BRE's SMARTWaste system[1.10] reports on both KPIs, and Constructing Excellence provides benchmark graphs for the first indicator (see Box 8). Other indicators include:

- Number of skips/containers per project (mixed/segregated)
- Cost of waste disposal per project/overall
- Amount of waste per dwelling/unit size
- Diversion of waste from landfill.

For construction projects with costs greater than £500 000, a comparison must be made of the likely and actual amount of waste arisings and the cost savings as a result of the implementation of the SWMP. This information will aid further estimating and targeting waste reduction strategies.

Targets can be set per project or per company. For example, the Allerton Bywater Millennium Community which will provide 520 homes and 25 000 m^2 of commercial and community space has set a target to reduce average construction waste (excluding groundwork) to a maximum 25 m^3 per dwelling.[1.20] The waste totals reported will exclude any waste segregated at source onsite. Targets can also be set for the amount/type of waste segregated, recycled and diverted from landfill.

Benchmarks can also be compared with national averages – BRE is currently working on a Defra-funded project: *Understanding and predicting construction waste*, which is defining

minimum reporting requirements for construction waste and generating benchmarks for project types. More information can be found on the BRE SMARTWaste website.[1.10]

Any waste data collected and targets set can be used within an environmental management system and for environmental reporting, and corporate social responsibility.

It is important that someone is assigned to collect the relevant waste data and that this data is reported on regularly at site level. This will assist in identifying if targets are likely to be met and what actions need to be taken, if any.

CASE STUDY 8 Pegasus Court social housing project, Oxford[1.11]

Description of project	Waste reduction measures	Achievements
This development of 42 houses and 27 flats was funded through Oxford City Council's single regeneration budget and the Housing Corporation and Ealing Family Housing Association. The main contractor was Wilmott Dixon Housing Ltd.	Used BRE's SMARTWaste tool to audit waste. Direct cost of wastage calculated on an individual product basis.	Average wastage rate was 5% (industry average of 5 to 10%). Costs for materials wasted onsite were over £46 000 (£700 per unit built) but, on an average site could be £100 000 (more than £1400 per unit built).

BOX 8

Where to find out more – Waste data

Constructing Excellence

Information on environmental key performance indicators including waste: www.constructingexcellence.org.uk/zones/kpizone/default.jsp.

SMARTWaste system

A collection of tools to help the construction industry monitor and benchmark waste onsite: www.smartwaste.co.uk.

Understanding and predicting construction waste

A Defra-funded website encouraging companies to enter data on construction waste and provide company and national benchmarks: www.smartwaste.co.uk/benchmarking.jsp.

Zero Net Waste (WRAP)

An introduction to a methodology for measuring waste neutrality: www.wrap.org.uk/construction/the_net_waste.html.

1.7.9 Regular site waste management plan review

Once a SWMP is implemented, it is important that it is regularly reviewed to ensure that it is being adhered to, is practical and appropriate and is amended if required. This can be done by simply including the SWMP as an agenda item for weekly/fortnightly/monthly meetings. The SWMP can also be audited eg by a head office environmental team to ensure its effectiveness.

1.7.10 Site waste management plan review recommendations

It is important that recommendations and lessons learned from the implementation of a SWMP can be applied to other sites and throughout the company. This includes reviewing the estimated forecast of waste arisings with actual waste figures, and that it can be achieved by various means:

- Debrief the client and project team in terms of the successes, targets, recommendations, good and bad practice
- Include the SWMP as an agenda item for post-contract reviews

- Establish benchmarks and new targets based on SWMP experience, aiming for continual improvement
- Hold educational/training workshops within the company on SWMP experiences
- The head office environmental team can audit and collate SWMP information from all sites and make company-wide recommendations
- Update policy and procedures including environmental management systems
- Feed results into annual reports and newsletters
- Establish an area for SWMPs on the company's intranet
- Provide financial incentives for meeting/exceeding targets
- Publish case studies and pass on the information to organisations including Envirowise, WRAP and BRE.

Other initiatives could include providing feedback to the procurement team, the design team, the trade contractors and the supply chain waste management contractors in order to establish agreements and continuous improvement. Previous SWMP information and experiences can also be used for new tenders, pre-qualification exercises and pre-contract meetings.

References and notes for section 1

1.1 The Site Waste Management Plans Regulations 2008. Statutory instruments 314.

1.2 www.defra.gov.uk/environment/waste/strategy/strategy07/index.htm.

1.3 The Code for Sustainable Homes. www.planningportal.gov.uk and www.breeam.org.

1.4 Waste Framework Directive (European Directive 2006/12/EC).

1.5 The Environmental Protection Act 1990.

1.6 The 1975 Waste Framework Directive.

1.7 Waste management, The Duty of Care. A code of practice (1996). London, HMSO.

1.8 Environmental Protection Act 1990 (Duty of Care) Regulations 1991.

1.9 DTI (2004). Site waste management plans: Guidance for construction clients and contractors.

1.10 www.smartwaste.co.uk.

1.11 Saving money and raw materials by reducing waste in construction: case studies (GG493). www.envirowise.gov.uk.

1.12 www.aggregain.org.uk/demolition/the_ice_demolition_protocol/index.html.

1.13 www.wrap.org.uk.

1.14 www.bre.co.uk/greenguide/page.jsp?sid=435.

1.15 www.greenspec.co.uk.

1.16 Saving money and raw materials by reducing waste in construction: case studies from Scotland (GG500). www.envirowise.gov.uk.

1.17 BRE (2000). The green guide to specification for housing. Garston, Watford, IHS BRE Press.

1.18 www.opsi.gov.uk/SI/si2005/20050895.htm.

1.19 www.opsi.gov.uk/legislation/wales/wsi2005/20051820e.htm.

1.20 www.englishpartnerships.co.uk/allertonbywater.htm.

SECTION 2

PROCUREMENT GUIDANCE

Who should read this section?				
Section 2 Procurement guidance	✔			

Setting the standard

Clients can have a positive impact on waste management and resource use by setting requirements for good and best practice during the procurement process. In particular, by setting targets which will require contractors to measure waste quantities and destinations, and to reduce waste and divert it from landfill where practical and economical. Clients should ensure a systematic approach through the design and planning stages, and maximise the potential cost and environmental savings.

Figure 3 illustrates how requirements can drive good practice from the outline design stage, through to construction onsite, by reporting performance and identifying opportunities for improvement. Figure 4 (p.40) is a model process map used to illustrate how waste reduction can be embedded in the construction process.

Project stage	Documentation for waste management	
Pre-project	Policy statements	
Briefing/pre-qualification	Project briefs	
	Design team pre-qualification	
	Contractor pre-qualification	
Design	Traditional procurement	Design and build
	Appointment of team	Employer's requirements
Pre-construction	Tender specifications/briefs	
	Contract clauses	
Partnering framework	Framework agreement	

Figure 3 Typical waste management considerations at the procurement stage *(Figure 3 courtesy of WRAP)*.

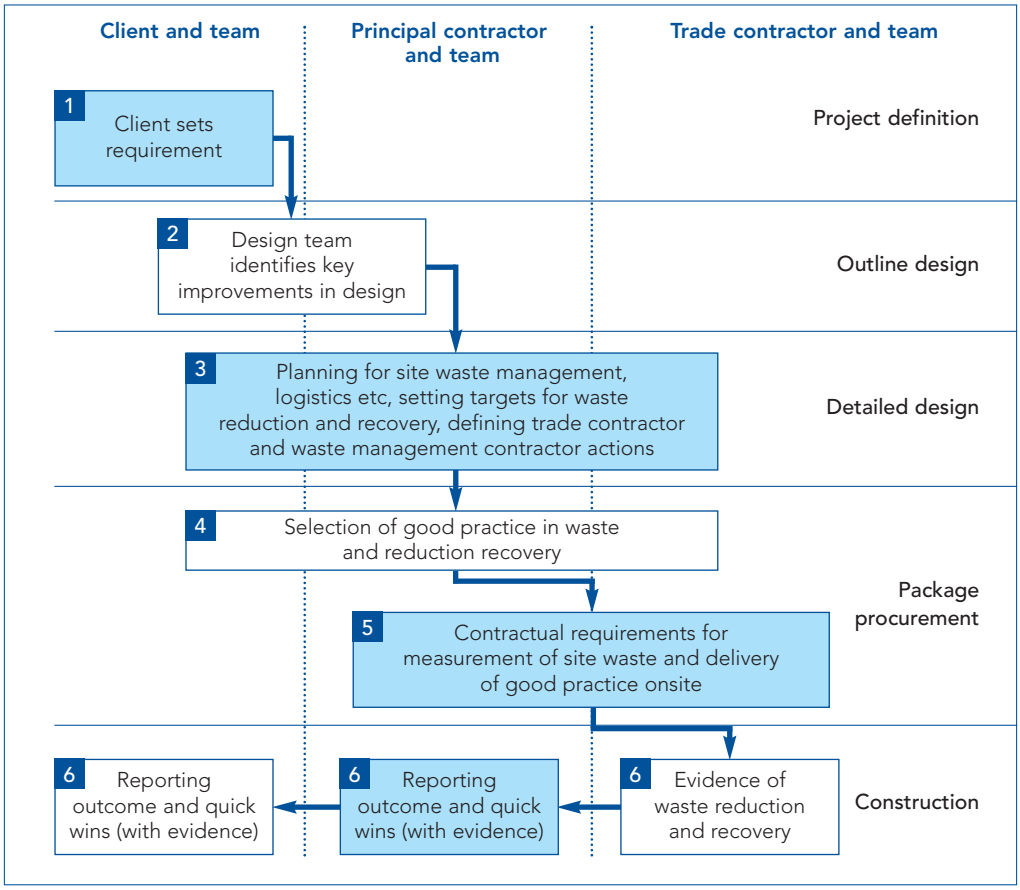

Figure 4 Model process map.[2.1]

The following example of a statement could be used to describe what the client is aiming to achieve:

….we require a site waste management plan to be submitted and implemented as part of all construction activities in line with relevant good practice. The site waste management plan is required to evaluate the level of waste reduction, reuse and recycling is possible, measure waste arising from the project and set targets for waste reduction and materials diverted from landfill.

2.1 Choice of procurement route

The procurement process encompasses the whole life cycle of the contract – from identification of the need, design, tendering, appointment processes and contract management, to finalising the contract.

In order to encourage improved waste management, and the greater use of recovered materials onsite, the procurement route adopted should tackle a key cultural habit: lack of and/or late involvement of specialist contractors and suppliers in the design and planning process.

The most effective procurement process allows the client, designer, contractor(s) and supplier(s) to work together as an integrated team. Clients with long experience of traditional procurement may find partnering a challenge, eg they may remain sceptical of the motives of the supply side. Contractors, on the other hand, are wary of giving too much away and taking on uncharted risk.

Clients should take the lead and demonstrate good practice, encourage innovation, and gain the support of the supply side. The choice of procurement route sends a clear signal about how a client wants to be perceived by the construction industry and other stakeholders (Box 9).

BOX 9

Key recommendations – Choice of procurement route

Clients wishing to encourage better site waste management through waste minimisation and improved management of waste should:

- Ensure that corporate objectives encourage waste reduction, materials recovery and recycling are incorporated into procurement documentation and buying decisions
- Consider early involvement of the supply chain in order to maximise the opportunities to design out waste and plan for good practice
- Select procurement routes that include long-term relationships and continuous improvement targets for waste management.

2.2 Pre-tender/pre-qualification stage

Before issuing full tender documentation, it is cost-efficient to identify potential suppliers willing to support the client's objectives and help develop these objectives further. This is achieved through a pre-qualification exercise in which prospective companies submitting a tender are asked to demonstrate credentials against criteria that are not readily quantifiable. Only those who meet certain criteria, eg their ability to demonstrate compliance with the Duty of Care requirements[2.2] by supplying appropriate documentation, should be asked to submit a full tender.

Pre-qualification is based on financial assessment, technical capacity and history of past performance. Suppliers should demonstrate that they have the technical and financial capacity to undertake the works, and that they have appropriate management systems, such as quality assurance, occupational health, safety and rehabilitation, environmental management and industrial relations. It should be made clear that the client may choose to visit suppliers to verify claims (Box 10).

BOX 10

Key recommendations – Pre-tender/pre-qualification stage

As part of this process, clients wishing to encourage waste minimisation and improved waste management should evaluate the tendering companies' awareness and experience of developing and implementing good practice in managing waste onsite, and their ability to motivate and specify trade contractors and waste service providers to deliver the required performance.

2.3 Tender requirements

The client requirements for waste management should be clearly described in the tender specification. This is the key intervention point in the procurement process where policy objectives, such as sustainability, can be applied (Box 11).

BOX 11

Key recommendations – Tender requirements

Clients wishing to encourage good practice on materials' wastage should set outcome-based requirements for construction waste minimisation and management in the tender specification. These requirements may include:

- Quantitative KPIs, minimum standards and improvement targets for waste reduction, reuse and recycling or a requirement to agree targets for such parameters and demonstrate their achievement
- Minimum requirements for specific elements of work (such as recovery of demolition waste).

At the tender evaluation stage, clients can award credits to those tendering that most effectively contribute to the client's requirements and objectives. The client can also give some weighting for waste minimisation and recovery, but this would probably be minor in relation to other project objectives. Therefore, it is preferable to set clear minimum requirements for waste management in the tender specification, with which all those tendering should comply.

2.4 Forms of contract

Forms of contract govern the construction industry. Contractual relationships in projects can be complex, with the involvement of many players whose roles and responsibilities vary over the life of the project and beyond. There are various standard forms of contract, which are under constant development in order to reflect best practice, together with emerging case law, legislation and loopholes.

Forms of contract are relatively neutral with respect to the addition of requirements for better waste management. However, forms of contract that are better able to involve the client have higher levels of design management, a capacity for incorporating change and clear lines of responsibility for resolving remedials and are more likely to be better suited to achieving better waste management.

Partnering agreements can be entered into after a formal contract is awarded. In this case, it is only the formal contract that is subject to the normal competitive process (Box 12).

BOX 12

Key recommendations – Forms of contract

Contracts more suited to achieving better waste management and incorporating SWMPs will have the following characteristics:

- Higher levels of client involvement
- Better design management integration
- Greater capacity for incorporating change
- Clear lines of responsibility for resolving remedials.

2.5 Targets

The following types of KPI and improvement targets should be agreed with the principal contractor:

- Percentage recovery of waste materials for reuse and recycling. (Different target levels may be appropriate for different stages of construction, such as demolition, new build, fit-out and refurbishment.)
- Percentage reuse of materials onsite (particularly relevant where large-scale demolition is included)
- Percentage reduction in m^3 or tonnage of waste per unit of construction activity (evaluated as a continuous improvement target). If the designer and principal contractor identify specific areas to be targeted for improvement, such as recycling of plasterboard and reduction in packaging waste, specific targets can be agreed in these areas, including maximum wastage rates for key materials/products. It is also possible to compare total waste quantities against sector benchmarks maintained by BRE (www.smartwaste.co.uk) and as shown in the key recommendations in Box 13 and Table 4.

BOX 13

Key recommendations – Targets

- Establish clear mapping between the client's strategic objectives and KPIs for construction waste
- Set targets for reducing waste by diverting waste from landfill and increasing the use of recycled and reclaimed materials in the construction process ie develop the benchmarks for these categories in the first year, and set targets for improvement over a five to ten year period
- Agree and set a monitoring methodology to determine performance
- Provide incentives for meeting and exceeding the contract or scheme targets. Suggested level: 0.5% of the tender value as a bonus
- Feed back the improved performance results to relevant parties
- Use the KPIs as evidence of alignment with client objectives.

TABLE 4

Current environmental performance indicator for housing*

Project type	m^3 waste/100 m^2 of floor area	m^3 waste/£100K of project value
Residential	17.7	13.4

**This information is available on the SMARTWaste website (www.smartwaste.co.uk) and is regularly updated.*

WRAP has produced guidance for achieving good practice waste minimisation and management for construction clients, design teams and contractors. This includes model clauses for procurement. The guide can be downloaded from WRAP's website (www.wrap.org.uk).

References and notes for section 2

2.1 WRAP. Achieving good practice waste minimisation and management. Download from www.wrap.org.uk/downloads/Mid-level_WMM_guide_lo-res_for_web.667ab11a.pdf.

2.2 Environmental Protection Act 1990 (Duty of Care) Regulations 1991.

SECTION 3

WASTE MANAGEMENT PRACTICE: Guidance and templates for standard, good and best practice

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Part 1: Standard practice

Construction projects with an estimated project cost of greater than £300 000 are required to prepare, implement and review a site waste management plan under The Site Waste Management Plans Regulations 2008.[3.1]

Standard practice guidance and templates described in this section comply with the Regulations for projects with an estimated project cost over £300 000. The guidance and templates in this part (standard practice) is for use on projects with an estimated project cost of less than £500 000.

Projects following standard practice are required to comply with *minimum* standards and legal requirements. A standard practice SWMP includes a brief description of waste types generated and their disposal routes and confirmation of waste management licences and registrations under the Environmental Protection Act 1990 (Duty of Care) Regulations 1991.[3.2] Under The Site Waste Management Plans Regulations 2008[3.1] the predicted amount of waste generated must be estimated prior to construction commences.

Figure 7 on page 48 shows the steps involved in a standard practice SWMP.

Consider the following points before writing and implementing a standard practice SWMP.

3.1 Legal compliance and minimum standards

3.1.1 Legal compliance

Duty of Care practices (the Duty of Care Regulations 1991[3.2] and Duty of Care code of practice 1996[3.3]) should be periodically audited onsite. These practices should include:

- Providing waste transfer notes (WTNs) for inspection
- Site registration for production of hazardous waste
- Providing consignment notes for hazardous waste for inspection
- Checking the waste carrier's licence

- Checking the waste transfer station licence
- Checking waste exemptions/licences.

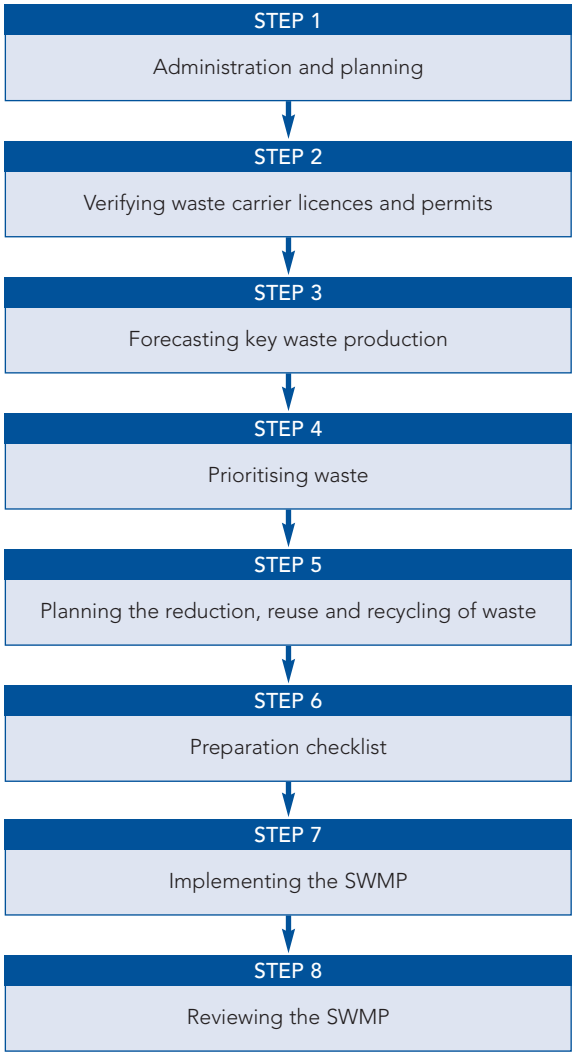


Figure 7 The steps in a standard practice site waste management plan.

3.1.2 Responsible person

An individual should be responsible for writing and implementing the SWMP.

3.1.3 Waste management contractors

A standard waste management package should be used with a waste management contractor. No targets are required to be set. (See section 4: Procurement of contractors for more information.)

3.1.4 Trade contractors

When tendering for work, waste minimisation issues do not have to be considered and trade contractors are not bound to segregate waste. (See section 4: Procurement of contractors for more information.)

3.1.5 Waste minimisation

A statement for the project's design, construction method and materials used in relation to any minimisation of waste should be included in the SWMP.

3.1.6 Identification of waste arisings and disposal routes

A brief description of waste types, amounts and disposal routes should be drawn up before the SWMP is implemented.

3.1.7 Site implementation

The site manager must ensure that the licensing permits of the appointed waste management contractors and other disposal facilities are in place to fulfil the Duty of Care Regulations in order to avoid prosecution.[3.2]

Waste materials, concrete and other potential fill materials (either onsite or offsite), as well as high value materials such as metals, should be reused or recycled. Waste streams that have good recovery rates should be segregated, and hazardous and non-hazardous waste should also be segregated.

Types of waste:

- Non-hazardous
- Hazardous (onsite segregation)
- Metals
- Inert materials.

WRAP guidance[3.4] recommends that sites operating standard practice should achieve waste material recovery rates as shown in Table 5.

TABLE 5

Recovery rate of waste materials for standard practice onsite

Waste material	Baseline/standard practice recovery (%)
Cement	N/A
Ceramics	75
Concrete	75
Electrical equipment	N/A
Furniture	0–15
Hazardous	50
Inert	75
Insulation	12
Liquids and oils	100
Metals	95
Packaging	60
Plasterboard	30
Plastics	60
Timber	57
Miscellaneous	12

3.1.8 Training

Only limited SWMPs training of the workforce needs to be undertaken.

3.1.9 Monitoring

When waste is taken from the site, information should be collected on who removed the waste, the type of waste removed and where the waste has been taken. No appointed person is required to take ownership of waste monitoring. No targets are required to be set for waste management.

3.1.10 Community activities

Waste should be kept within the boundary of the site to minimise nuisance to the public.

3.2 Implementing standard practice

A fictitious construction project has been used in the following pages (Project Z) to illustrate how to implement a standard practice SWMP using each of the steps shown in Figure 7. The standard practice templates that follow can be used to compile a standard practice SWMP for actual projects. General guidance on how to implement the steps is given after the details of each step.

STEP 1 Administration and planning

Homebuilders Are Us Ltd has completed standard practice template 1 which contains a summary of the project.

Standard practice TEMPLATE 1 Project information CD

Client	Excellent Housing Ltd					
Principal contractor	Homebuilders Are Us Ltd					
Project manager	Alex Smith					
Author of the SWMP	Sue Jones					
Project title/reference	Project Z					
Project location	123 High Street, Nowhere					
Project cost (estimated)	£1.5 million					
Building footprint (m^2)	50 000 m^2					
No. of dwellings	40		m^2 per dwelling		80	
Start date	Day	01	Month	07	Year	2008
Completion date	Day	01	Month	12	Year	2009
Description of project scope (please tick)	Demolition	✔	Brick and block		✔	
	Timber frame construction		Modern methods of construction			
	Concrete frame construction	✔	Other (describe)			
Waste minimisation statement	At Project Z, we have considered how to minimise waste at a very early stage. This includes using standard sizes for plasterboard, elements of offsite fabrication and close collaboration with our supply chain to avoid over-ordering materials and reduce excessive packaging					
Waste champion	Sue Jones					
Version number and date (update as necessary)	V2. 10/07/2008					

STEP 1 Guidance notes

Key facts have been recorded for the SWMP in standard practice template 1. According to The Site Waste Management Plans Regulations 2008[3.1] it is a requirement to record details of the client, the principal contractor, the person who drafted the SWMP, and a description of the construction works (including the location of the site and the estimated cost of the project). Any decision taken on waste minimisation in relation to the nature of the project, design, construction method and materials employed also have to be recorded, this is a requirement under the Regulations 2008.[3.1] For projects with an estimated project cost of greater than £300 000 this must be carried out before construction work commences.

STEP 2 Verifying waste carrier licences and permits

Homebuilders Are Us Ltd has completed the register of waste carrier licences and permits (standard practice template 2) for waste management contractors removing onsite waste. It should be completed prior to the removal of the waste. Standard practice template 2 outlines the waste management licences, waste carrier licences and exempt site licences that have been checked and verified for use on Project Z.

Standard practice TEMPLATE 2 Register of waste carrier licences and permits CD

Waste description	Code	Origin of waste	Waste carrier			Disposal site	
			Name	Licence number	Expiry date	Name	Licence number/exemption reference
All construction and demolition waste	17 09 04	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Canteen waste	20 01 08	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Clinical waste	18 01 03 18 01 04	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Hazardous waste	17 03 03	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Muck offsite	17 01 07	Groundworks Ltd		L56789	10/12/08	Groundworks Ltd	LN13333

STEP 2 Guidance notes

From a legal perspective the principal contractor has a responsibility to dispose of the site waste at a licensed and suitable site under Section 34(1) of the Environmental Protection Act (Duty of Care) Regulations 1991[3.2] and related amendments. Any person who imports, produces, carries, keeps, treats or disposes of controlled waste has a duty of care to manage the waste responsibly. Failure to do this could result in an unlimited fine. As such, both the client and the principal contractor are responsible for maintaining the correct legislative procedures for offsite disposal of all waste on a project. Under The Site Waste Management Plans Regulations 2008,[3.1] the client and the principal contractor must declare that all reasonable steps will be taken to ensure that all waste from the site is managed responsibly, that materials will be handled efficiently and waste managed appropriately. This applies to projects with an estimated cost of greater than £300 000 under The Site Waste Management Plans Regulations 2008[3.1] and must be carried out before construction work commences.

Movement of waste offsite must be undertaken with the knowledge that the waste is being:

- Removed by a registered carrier
- Delivered to a facility licensed to accept the waste.

Waste transfer notes

The following information sets out the minimum requirements under the Environmental Protection (Duty of Care) Regulations 1991[3.2] and any amendments for information on all WTNs. It is the legal responsibility of the principal contractor to describe the waste as accurately as possible. The waste carrier must sign the WTN and hand over a copy to the site manager prior to leaving the site.

The principal contractor (not the waste carrier) is responsible for ensuring that the WTN contains the following information:

1. The name of the waste producer
2. Signature of the waste producer
3. Signature of the waste carrier
4. A description of the waste (inert, non-hazardous or hazardous) and the relevant European Waste Catalogue classification
5. The quantity of waste in terms of m^3 (eg 8, 16, 20, 30, 40, 50 m^3)
6. How the waste is stored (eg is the waste loose or is it stored in a skip that is open or lidded and/or is the container a roll-on roll-off bin?)
7. The name of the site where the waste is being created
8. The time that the waste was taken offsite by the waste carrier
9. The name and address of the waste carrier
10. The name and address of where the waste is being taken to, if different from point 9 above. Also, the name of the waste champion receiving the waste should be included
11. Whether the waste carrier is the producer or carrier of the waste (in most cases it should be the latter)
12. The information confirming that the waste carrier has a waste management licence under section 35 of the Environmental Protection Act 1990 (Duty of Care) Regulations[3.2] or of a disposal licence under section 5 of the Control of Pollution Act 1974[3.5]
13. The certificate number, and the Environment Agency stamp as the authority who issued it, is highlighted on the WTN.

The waste carrier should give the principal contractor a copy of the receipt for all waste transfers, or a copy of the invoice. WTNs must be retained for two years. If the waste is

hazardous, a consignment note must be obtained each time the waste is transferred, which must be kept for a minimum of three years under the Environmental Protection Act 1990 (Duty of Care) Regulations.

WTNs and licences should be regularly audited onsite to ensure legal compliance.

STEP 3 Forecasting key waste production

Standard practice template 3 has been completed by Homebuilders Are Us Ltd to record the waste generated throughout the project – from enabling works (including demolition) to construction works completion.

Standard practice TEMPLATE 3 Waste production checklist CD

Waste material	Enabling works (including demolition)		Construction works	
	Tick (✔)	Estimated quantity m^3	Tick (✔)	Estimated quantity m^3
Inert				
Aggregates	✔	500	✔	200
Brick/blocks	✔	300	✔	200
Ceramics	✔	200	✔	300
Concrete	✔	200	✔	100
Glass	✔	100	✔	50
Gravel		100		20
Sand				
Soils (uncontaminated)	✔	500		
Stone	✔	50		
Tarmac	✔	10	✔	10
Other				
Other				
Other				
Sub-total		1960		1000
Non-hazardous waste				
Canteen waste	✔	10	✔	50
Cardboard			✔	100
Metals – offcuts			✔	50
Metals – reinforcement				
Metals – steel			✔	50
Paper			✔	50
Plasterboard			✔	500
Plastics			✔	50
Polystyrene			✔	70

Standard practice template 3 (continued)

Waste material	Enabling works (including demolition)		Construction works	
	Tick (✔)	Estimated quantity m^3	Tick (✔)	Estimated quantity m^3
Non-hazardous waste (continued)				
Timber			✔	250
Trees	✔	300		
Vegetation (shrubs, bushes etc)	✔	200		
Other				
Other				
Other				
Sub-total		530		1050
Hazardous waste				
Asbestos	✔	200		
Bulk excavated (contaminated)				
Explosive	✔			50
Flammable				
Soils (contaminated)				
Toxic				
Other				
Other				
Other				
Sub-total		200		2100
Total volumes		2690		2100

STEP 3 Guidance notes

Forecasting waste production

Under the Site Waste Management Plan Regulations,[3.1] projects with an estimated cost of greater than £300 000 must estimate the quantity of each different waste type predicted to be produced and identify the waste management action proposed. This must be done before construction work commences.

A best estimate of waste quantities is sufficient – this will help prioritise the key waste produced. The total volumes of waste during enabling works (including demolition) and construction works should be summarised. Tonnes can also be used. A forecast of waste quantities will also be of use when negotiating waste management packages due to the economies of scale. It may also be possible to broker waste to another site that requires waste material, eg crushed concrete.

Once completed, standard practice template 3 can be used in the tender documentation for waste management contractors.

Waste categories

Waste generated on projects normally falls into three categories (in order of increasing environmental hazard), each containing different waste types depending on the project:

- **Inert waste** – waste that will not harm or cause adverse effects to the environment when disposed of, or does not decompose when buried. It has no potentially hazardous content once placed in landfill, eg rocks, concrete, mortar, bricks, blocks and tiles, plaster (not plasterboard), uncontaminated soils, aggregates and glass
- **Non-hazardous waste** – waste that will break down/decompose when buried, resulting in the production of landfill gases such as methane and carbon dioxide, eg timber, paper, cardboard, green waste, food, metal and plastics
- **Hazardous waste** – waste that is harmful to human health or environment, eg products liable to cause death, injury or impairment to living beings, pollution of waters or unacceptable environmental impact if improperly contained, handled, treated or disposed of. Hazardous waste includes waste with one or more of the following properties:
  - Explosive, oxidising, flammable, highly flammable, irritant, toxic, carcinogenic, corrosive, infectious, teratogenic, mutagenic, ecotoxic (see Table 6 for definitions of hazardous properties); waste which releases toxic gases in contact with water, air or acid
  - Waste, which after disposal, produces a leachate or other substances that possess any of the above properties
  - Harmful waste which, if it is inhaled or ingested or if it penetrates the skin, may involve limited health risks.

Under The Site Waste Management Plans Regulations 2008,[3.1] as a minimum, waste types must be identified at these levels (ie inert, non-hazardous and hazardous).

STEP 4 Prioritising waste

Standard practice template 4 has been completed by Homebuilders Are Us Ltd to aid waste prioritisation for enabling works (including demolition). Standard practice template 5 (p.56) has been completed for construction works.

Standard practice TEMPLATE 4 Enabling works (including demolition) CD

Waste material	Waste type	Origin of waste
Aggregates	Inert	Demolition
Bricks/blocks	Inert	Demolition
Ceramics	Inert	Demolition
Concrete	Inert	Demolition
Soils	Inert	Site strip
Tarmac	Inert	Site strip
Trees	Non-hazardous	Site strip
Vegetation	Non-hazardous	Site strip

Standard practice TEMPLATE 5 Construction works CD

Waste material	Waste type	Origin of waste
Canteen	Non-hazardous	All contractors
Cardboard	Non-hazardous	Fitting out
Ceramics	Inert	Bricklayers
Concrete	Inert	Substructure and superstructure
Metal – steel	Non-hazardous	Superstructure
Plasterboard	Non-hazardous	Drylining
Polystyrene	Inert	Fitting out

STEP 4 Guidance notes

The most significant waste for enabling works (including demolition) and construction works (by volume, weight or cost) should be listed for classification and definition of origin (include up to six listed in standard practice templates 4 and 5). This will help to focus the SWMP on site-specific issues of waste and the options for managing it. The origin of the waste should be considered with the means, tools, plant, processes, materials, procedures, training, and site layout to ensure the expected waste is managed accordingly.

TABLE 6

Definitions of hazardous properties

Property	Description	COSHH warning label
Corrosive	Any waste consisting of substances and preparations which may destroy living tissue on contact. For example, products with COSHH warning labels	
Explosive	Waste consisting of substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene and represents products having the following COSHH warning label	
Flammable	Waste that consists of liquid substances and preparations having a flashpoint equal to or greater than 21°C and less than, or equal to, 55°C	
Highly flammable	Waste that consists of: ▪ Liquid substances and preparations having a flashpoint below 21°C ▪ Substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature ▪ Solid substances and preparations which may readily catch fire after brief contact with a source of ignition and which continue to burn ▪ Gaseous substances and preparations which are flammable in air at normal pressure ▪ Any substances and preparations which, in contact with water or damp air evolve highly flammable gases in dangerous quantities	
Infectious	Waste that consists of substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in humans or other living organisms	
Oxidising	Waste that consists of substances and preparations which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances	

STEP 5 Planning the reduction, reuse and recycling of waste

Standard practice template 6 (p.58) is an example of a SWMP used by Homebuilders Are Us Ltd for planning the reuse, recycling and disposal of waste for enabling works (including demolition) and standard practice template 7 (p.59) for construction works on Project Z.

Standard practice TEMPLATE 6 Record of the reuse, recycling and disposal options of waste for enabling works (including demolition) CD

Waste material	Quantity (m^3)	Trade contractor package	Onsite recycling/reuse	Offsite recycling/reuse	Disposal
Concrete	200	Demolition, piling, concrete frame, groundworks and floors	Excess material can be dried and reused onsite as backfill	Segregate, reprocessed and reused in construction industry	Landfill and cover
Glass	100	Demolition		Segregate waste and send for recycling	Landfill
Green waste/vegetation	500	Earthwork, demolition and landscaping	Chip onsite for landscaping	Segregate, send for composting and use as mulch on land	Landfill
Hazardous waste (asbestos)		Demolition and strip out	N/A	N/A	Landfill
Hazardous waste (contaminated land)		Earthworks and groundworks	Remediate onsite and reuse material	Remediate offsite	Landfill
Hazardous waste (other)					Landfill
Metal		Steel frame, temporary works, concrete frame, decking and roofing	Reused in temporary works	Segregate waste and send to metal recycler	Landfill
Pallets		Cladding, brick and blockwork	Reuse pallets for internal storage and movement of materials	Send pallets for reuse	Landfill
Plasterboard		Demolition	Cannot reuse	N/A	Landfill
Rubble (hardcore)	500	Demolition, brick and blockwork	Use as hardcore onsite	Segregate, land reclamation, reprocessed and reused in construction industry	Landfill and cover
Soils	500	Piling, groundwork and earthworks	Reuse in landscaping and use as backfill	Land reclamation	Landfill and cover
Timber		Concrete frame, groundworks and joinery	Reuse for shuttering, temporary hoardings and general carpentry	Segregate for chipping to use in other timber construction products	Landfill
Totals	1800				

Standard practice TEMPLATE 7 Record of the reuse, recycling and disposal options of waste for construction works CD

Waste material	Quantity (m^3)	Estimated trade contractor package	Onsite recycling/reuse	Offsite recycling/reuse	Disposal
Cable wiring	10			Segregated and send for recycling in order to recover high value metals	Landfill
Canteen	25	Canteen and logistics	Compost for landscaping (must be kept separate from other waste and stored in closed top bins)	Send for composting (food waste only)	Landfill
Green waste/vegetation		Earthwork, demolition and landscaping	Chip onsite for landscaping	Segregate, send for composting and use mulch on land	Landfill
Hazardous waste (paint tins, line markers and mastic)	50	All trades	Use a lockable COSHH container for storage	Incinerator/landfill	Landfill
Hazardous waste (other)					Landfill
Insulation	50				Landfill
Metal	50	Steel frame, temporary works, concrete frame, decking and roofing	Reused in temporary works	Segregate waste and send to metal recycler	Landfill
Mixed waste	100	All trades		Send to transfer station for further segregation	Landfill
Office	25	Site management and major packages	Reuse paper, cartridges, plastic cups, tins and cardboard	Segregate and recycle white paper	Landfill
Packaging	150	M&E, fit-out, cladding		Segregate cardboard, pallets and plastic for recycling	Landfill
Pallets	20	Cladding, brick and blockwork	Reuse pallets for internal storage and movement of materials	Send pallets for reuse	Landfill
Plasterboard	500	Dry lining	Keep in dedicated storage place for offcuts to reuse	Send back to plasterboard manufacturer	Landfill
Timber	300	Concrete frame, groundworks and joinery	Reuse for shuttering, temporary hoardings and general carpentry	Segregate for chipping to use in other timber construction products	Landfill
Totals	1800				

STEP 5 Guidance notes

Standard practice templates 8, 9 and 10 show the possible waste management options for waste materials generated onsite.

Standard practice TEMPLATE 8 Waste management options for inert waste CD

Waste material	Reuse	Recycle/scrap	Landfill	Incinerate	Other
Aggregates	Hardcore and fill				
Brick/blocks					
Concrete	Hardcore and fill	Crushed for aggregate			
Glass	Use glass as aggregate replacement in tarmac				
Gravel		Sell to building contractor			
Plastics					
Polystyrene					
Rock		Sell to building contractor	Final option	Final option	
Sand		Sell to building contractor			
Soils (uncontaminated)	Land balancing – use as landfill cover	Sold as landfill cover material			
Tarmac	Planings in new tarmac				

Standard practice TEMPLATE 9 Waste management options for non-hazardous waste CD

Waste material	Reuse	Recycle/scrap	Landfill	Incinerate	Other
Canteen waste		Animal feed and compost via waste management contractor			
Cardboard		Collect and use compactor and bailer			
Gypsum products		Return waste to supplier			
Metals offcuts		Scrap merchant			
Metals – reinforcement		Scrap merchant			
Metal – steel		Scrap merchant			
Paper	Scrap notepaper	Recycle via waste management contractor			
Plasterboard		Return waste to supplier	Final options	Final options	
Plastic		Composting via waste management contractor			
Timber	Shuttering for temporary cable protection and road humps	Pallets (deposit/return), sale of flooring and support to scrap merchant			
Trees	Mulch and landscaping cover	Compost onsite			
Vegetation		Compost onsite			

Standard practice TEMPLATE 10 Waste management options for hazardous waste CD

Waste material	Reuse	Recycle/scrap	Landfill/incinerate	Other
Asbestos	Specialist contractor			
Explosive	Producer responsibility			
Flammable	Producer responsibility			
Soil (contaminated)	Sold as landfill cover material (depending on level)			
Topsoil (contaminated)	Sold as landfill cover material (depending on level)	Final options	Final options	
Toxic	Producer responsibility			

Planning for waste management onsite

Identifying waste management options with contractors

Investigate waste management options with local and national waste management contractors to either: segregate and recycle waste or reuse waste. Offsite disposal to landfill or offsite incineration (combustion) should be considered as the last option.

Sharing services with other sites

Find out if there are other sites in the area and see if the waste management contract could be shared. This would also provide economies of scale for material take-back schemes.

STEP 6 Preparation checklist

Standard practice template 11 has been used by Homebuilders Are Us Ltd as a checklist for preparing its SWMP.

Standard practice TEMPLATE 11 Preparation checklist CD

Checks (please tick)	Yes	No
1. Has administration and planning been fully completed?	✔	
2. For offsite waste management or disposal are all the waste destination details verified?	✔	
3. Have all the key wastes been forecasted and prioritised?	✔	
4. Have reuse/recycling/disposal options been identified for the waste?	✔	
5. Have terms and commercial rates been agreed with the waste management contractor(s)?	✔	
6. Have data reporting procedures been agreed with the waste management contractor(s)?	✔	
7. Has a waste segregation/collection area been prepared?	✔	
8. Has the SWMP area been adequately signposted?	✔	
9. Has the SWMP planning meeting been set?	✔	
10. Has the SWMP document control/filing system been set up?	✔	
11. Have all necessary staff and contractors read and signed the SWMP?	✔	

	Yes	No
12. Have all the SWMP training/briefing requirements for contractor/s been met?	✔	
13. Have the waste management targets/KPIs been set?	✔	
14. Has the SWMP been approved by the project manager?	✔	
Comments/further actions		
1.		
2.		
3.		
4.		
Revisions		
Nature of revision	**Date of revision**	**Owner of revision**
Meeting with the client and demolition contractor – changed some of the waste management actions	10/07/08	Sue Jones

STEP 6 Guidance notes

Prior to implementing the SWMP, the waste champion should complete all necessary checks using the checklist (standard practice template 11) to ensure the effective operation, monitoring and reporting of the SWMP.

STEP 7 Implementing the site waste management plan

The SWMP should be implemented as soon as construction work commences. Homebuilders Are Us Ltd has used standard practice template 12 to record waste information for Project Z. The key elements of the implementation are:

Setting the contract

- Set minimum contract terms, commercial rates and document controls with waste management contractors
- Define disposal routes, address and contact details of waste destination
- Ensure there is a document filing system.

Site set-up

- Staff should read the SWMP (as required)
- Ensure all trade contractors are briefed on the SWMP and training provided if trade contractors require it
- Place signage around the site to ensure that waste collection points are clearly marked.

Standard practice TEMPLATE 12 Record of waste management information CD

Date removed	Waste type	Identity of waste removal company	Site the waste is being taken to and whether licensed or exempt	Waste carrier and registration number	Confirmation of delivery	Waste management route (reused on/offsite, recycled on/offsite, recovery, landfill, otherwise disposed)
11/07/08	Inert	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678123	Recycled offsite
16/07/08	Inert	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678124	Recycled offsite
18/07/08	Mixed non-hazardous	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678125	Recovery – sorted offsite by waste management contractor
01/08/08	Mixed non-hazardous	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678126	Recovery – sorted offsite by waste management contractor
15/08/08	Mixed non-hazardous	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678127	Recovery – sorted offsite by waste management contractor

Waste Aware Construction provides signage for a nationally agreed colour coding scheme which is freely available through its website as editable PDFs. The signs are a simple and effective way to promote streaming and segregating construction waste at source. The signs are available at www.wasteawareconstruction.com (Figure 8).

Figure 8 Colour coded signage to identify waste collection points.

For projects with an estimated cost greater than £300 000, the identity of the company removing the waste, the types of waste removed and the site the waste is being taken to must be recorded. For projects with an estimated cost of greater than £500 000, extra information must be recorded including:

- The types and quantities of waste produced.
- The types and quantities of waste that have been:
  - Reused (on or offsite)
  - Recycled (on or offsite)
  - Recovered (on or offsite)
  - Landfilled
  - Otherwise disposed of.

Standard practice template 13 (p.64) is an example of a template which could be used to record this information.

Standard practice TEMPLATE 13 Types and quantities (estimated in m^3 or tonnes) of waste and its management CD

Waste type	Waste material	Reuse onsite	Reuse offsite	Recycling onsite	Recycling offsite	Other form of recovery onsite	Other form of recovery offsite	Sent to landfill	Other disposal
Inert	Concrete	12	3						
	Rubble (hardcore)								
Non-hazardous	Cable and wiring								
	Glass								
	Metal						10		
	Mixed waste								
	Office/canteen								
	Packaging								
	Plasterboard								
	Timber			5					
	Other								
Hazardous	Asbestos							10	
	Contaminated land								
	Paint tins, line markers and mastic							0.05	

STEP 7 Guidance notes

Information should be obtained from the waste management contractor to record what happens to the waste once it is removed offsite. If the waste is recovered onsite then this also needs to be included in the SWMP. The template (standard practice template 13) should be completed at least every six months.

STEP 8 Reviewing the site waste management plan

An important part of managing a SWMP is to review how waste has been managed throughout the project. Standard practice template 14 is an example of a SWMP review that has been completed by Homebuilders Are Us Ltd.

Standard practice TEMPLATE 14 Review of waste information CD

Waste material	Estimated quantity (m^3)	Actual quantity (m^3)	Difference (+/-)	Reason for variance
Enabling works (including demolition)				
Concrete	200	250	+50	More concrete than anticipated in demolition of structure
Glass	100	100	0	
Green waste/vegetation	500	600	+100	More vegetation than expected
Hazardous waste (asbestos)	200	200	0	
Hazardous waste (contaminated land)	0		0	
Hazardous waste (other)	0		0	
Metal	0	50	+50	Metal was missing from initial forecast
Pallets	0	0	0	
Plasterboard	0	0	0	
Rubble (hardcore)	800	700	-100	Less hardcore (from bricks/blocks from demolition)
Soils	500	500	0	
Timber	0	20	+20	Timber was missing from initial forecast
Construction works				
Cable wiring	10	8	-2	More efficient use of materials
Canteen	25	25	0	
Green waste/vegetation	0	0	0	
Hazardous waste (paint tins, line markers and mastic)	50	50	0	
Hazardous waste (other)				
Insulation	50	60	+10	Rework had to be undertaken
Metal	50	40	-10	Less metal due to more efficient use of materials
Mixed waste	100	100	0	
Office	25	25	0	
Packaging	150	200	+50	More packaging generated from fit-out stages
Pallets	20	30	+10	More materials supplied on pallets than originally thought
Plasterboard	500	400	-100	Standard sizes used
Timber	250	220	-30	Less timber due to better ordering of materials

Deviations from the SWMP and cost savings:

STEP 8 Guidance notes

- Compare the estimated waste with the actual waste arisings and note down the reasons for any variance; this is a legal requirement for projects over £500 000. Use these figures to help you write your next SWMP
- Write down any cost savings from implementing the SWMP – this is a legal requirement for projects over £500 000.

Part 2: Good practice

Construction projects with an estimated project cost of greater than £300 000 are required to prepare, implement and review a site waste management plan under The Site Waste Management Plans Regulations 2008.[3.1]

Good practice guidance and templates described in this section comply with and go beyond the Regulations and the mandatory requirements of The Code for Sustainable Homes[3.7] for all projects, as well as providing additional benefits including cost savings. The guidance and templates are applicable to all projects across the UK.

A construction project following good practice *goes further* than implementing minimum standards and legal requirements. It should also include consideration of the waste hierarchy and waste minimisation issues at the design stage.

Waste should be measured and monitored against standard industry KPIs and a regular review of the management of waste onsite should be carried out and be included in the SWMP.

- All the major material waste streams generated by the project should have basic onsite segregation if space allows. A recycling target with a waste management contractor should be also set at the start of the project. Information on waste management practices onsite should be provided during site inductions and all staff should be made aware of this
- A take-back scheme should be in operation onsite eg for pallets. Labelling and colour coding of skips should be set up for the different material streams segregated onsite
- Someone should be nominated as waste champion. Duty of Care should be periodically audited onsite under the Environmental Protection Act 1990 (Duty of Care) Regulations 1991.[3.2]

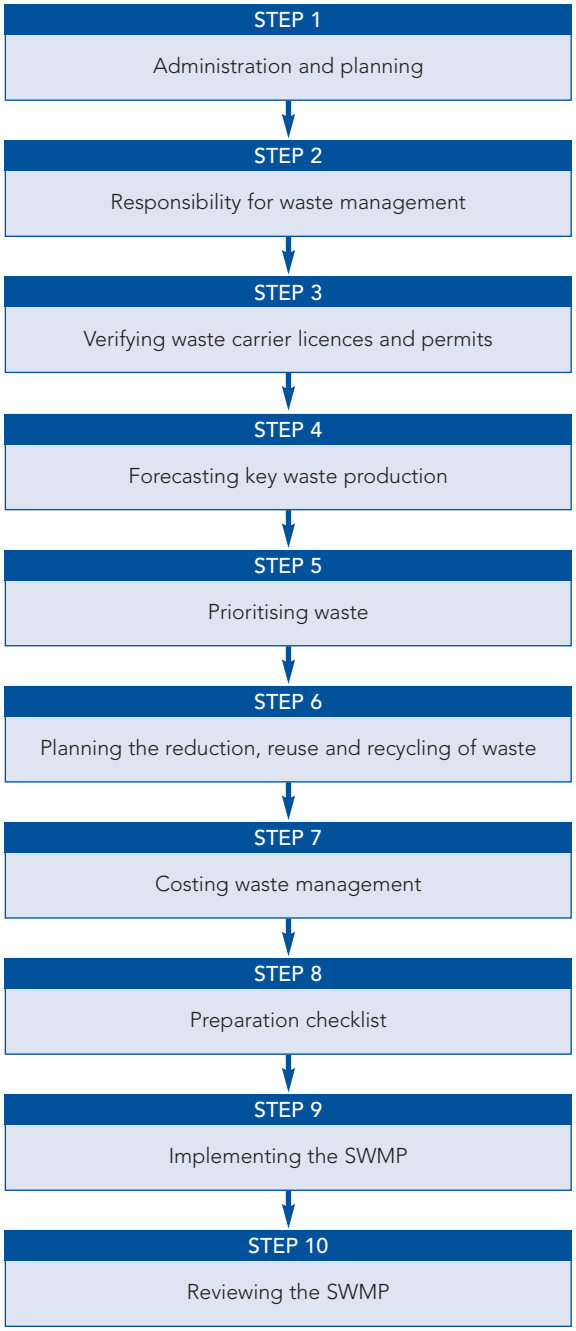


Figure 9 The steps in a good practice site waste management plan.

Figure 9 shows the steps involved in a good practice SWMP.

Consider the following points before writing and implementing a good practice SWMP.

3.3 Legal compliance and minimum standards

3.3.1 Legal compliance

Duty of Care practices (under the Duty of Care Regulations 1991[3.2] and Duty of Care code of practice 1996)[3.3] should be audited periodically onsite. These practices should include:

- Providing waste transfer notes (WTNs) for inspection
- Site registration for production of hazardous waste
- Providing consignment notes for hazardous waste for inspection
- Checking the waste carrier's licence
- Checking the waste transfer station licence
- Checking waste exemptions/licences.

3.3.2 Responsible person

An individual should be appointed as overall waste champion. This person should be given authority to ensure co-operation with staff and trade contractors onsite. An individual should also be responsible for writing and implementing the SWMP (this could be the responsibility of the waste champion but it could also be given to a more appropriate person). Responsibility should also be given to named individuals for each waste type per work package.

3.3.3 Waste management contractors

A recycling target with a waste management contractor should be set out at the start of the project. This is especially important for any mixed waste leaving the site. The waste management contractor should be audited periodically by the principal contractor. (See section 4: Procurement of contractors for more information.)

3.3.4 Trade contractors

Waste minimisation issues do not have to be considered when tendering for work. Clauses should be included in the contract documentation to require trade contractors to participate in material segregation. Trade contractors should be encouraged to supply information on the types and amounts of waste they are likely to produce and feed this into the SWMP. (See section 4: Procurement of contractors for more information.)

3.3.5 Waste minimisation

A good practice SWMP should include consideration of the waste hierarchy (see Figure 1). Waste minimisation should be considered at the design stage of the project.

3.3.6 Identification of waste arisings and disposal routes

Identification of waste arisings and options for reduction, reuse and recycling should be addressed before the start of the project. This should be done for waste types and amounts and related to the work package.

3.3.7 Supply chain

Ordering pre-sized materials and just-in-time delivery should be practised onsite. Take-back schemes, eg for pallets, should be set-up onsite. Materials with a recycled content do not have to be preferentially sourced.

3.3.8 Site implementation

The site manager/waste champion should implement and review waste management activities onsite. Labelling and colour coding of skips (see Figure 10 on p.89) should be used for the material streams that will be segregated onsite (if space permits). Materials should be stored onsite appropriately to avoid material wastage due to inadequate storage.

The reuse of concrete waste and other potential waste fill materials (either onsite or offsite) should be practised. A 'reuse area' could also be set-up for other materials. Waste (if space is available) should be segregated into the following streams for offsite recycling:

- Metal
- Wood
- Inert waste
- Hazardous waste
- Packaging
- Plasterboard (and other waste major waste streams)
- Mixed/general construction waste (non-hazardous).

The site manager/waste champion should try to achieve quick wins, ie a higher rate of recovery resulting in cost benefits in recovery practice. Research commissioned by WRAP[3.4] recommends that sites operating good practice should achieve material recovery rates as shown in Table 7.

TABLE 7

Recovery rate of waste materials for good practice onsite

Waste material	Quick win (%)/or good practice
Cement	75
Ceramics	85
Concrete	95
Electrical equipment	70*
Furniture	25
Hazardous	N/A
Inert	95
Insulation	50
Liquids and oils	90
Metals	100
Packaging	85
Plasterboard	90
Plastics	80
Timber	90
Miscellaneous	50

* This is a required target for the type of predicted waste from electrical and electronic equipment from construction sites, eg lighting as part of the Waste Electrical and Electronic (WEEE) Regulations.[3.6]

3.3.9 Training

Training on waste segregation, reuse and recycling should be delivered to all trade contractors and operatives on the project during site inductions and toolbox talks. Specific training relating to environmental issues onsite for key staff should be delivered and feedback should be welcomed with appropriate incentives put in place.

3.3.10 Monitoring

The amount and type of waste generated should be measured by comparing estimated waste with actual amounts generated, and onsite waste should be monitored and compared with targets. Industry-based KPIs could be used for monitoring.

3.3.11 Community activities

The Considerate Contractors Scheme should be used (www.consideratecontractorsscheme.org.uk/ htm-home/index.html).

3.4 Implementing good practice

A fictitious construction project has been used in the following pages (Project Z) to illustrate how to implement a good practice SWMP for each of the steps shown in Figure 9. The good practice templates that follow can be used to compile a good practice SWMP for actual projects. General guidance on how to implement the steps is given after the details of each step.

STEP 1 Administration and planning

Good practice templates 1, 2 and 3 have been completed by Homebuilders Are Us Ltd to log key information about the project.

Good practice TEMPLATE 1 Project information CD

Client	Excellent Housing Ltd					
Principal contractor	Homebuilders Are Us Ltd					
Project manager	Alex Smith					
Author of the SWMP	Sue Jones					
Project title/reference	Project Z					
Project location	123 High Street, Nowhere					
Project cost (estimated)	£1.5 million					
Building footprint (m^2)	50 000 m^2					
No. of dwellings	40		m^2 per dwelling		80	
Start date	Day	01	Month	07	Year	2008
Completion date	Day	01	Month	12	Year	2009
Description of project scope (please tick)	Demolition	✔	Brick and block		✔	
	Timber frame construction		Modern methods of construction			
	Concrete frame construction	✔	Other (describe)			
Waste minimisation statement	At Project Z, we have considered waste minimisation at a very early stage. This includes using standard sizes for plasterboard, elements of offsite fabrication and close working with our supply chain to avoid over ordering materials and reduce excessive packaging. We will seek to reuse materials onsite wherever feasible and excess materials will be sent back to suppliers					
Waste champion	Sue Jones					
Version number and date (update as necessary)	V2. 10/07/2008					

Good practice TEMPLATE 2 Waste management project administration CD

Position	Name	Contact details
Client	Ian Reynolds	Tel: 0800 900 000
Client waste management representative (if applicable)	N/A	N/A
Project manager	Alex Smith	Tel: 0800 100 000
Waste champion	Sue Jones	Tel: 0800 200 000
Document controller/secretary	Tom Elliot	Tel: 0800 300 000

Good practice TEMPLATE 3 Record of waste management planning meetings CD

Date	Organiser	Attendance record (name and company)	Notes taken by
08/07/2008	Sue Jones	Ian Reynolds – Excellent Housing Ltd Alex Smith – Homebuilders Are Us Ltd Tom Elliot – Homebuilders Are Us Ltd Frank Swan – Demolition Ltd	Sue Jones

STEP 1 Guidance notes

Project description

Good practice templates 1, 2 and 3 can be used to provide key information about waste minimisation, including examples.

Key facts can be recorded for the SWMP. Under The Site Waste Management Plans 2008[3.1] it is requirement to record details of the client, the principal contractor, the person who drafted the SWMP, a description of the construction works including the location of the site and the estimated cost. Any decision taken on waste minimisation in relation to project nature, design, construction method and materials employed also has to be recorded. This is a requirement for all projects with an estimated project cost greater than £300 000 under The Site Waste Management Plans Regulations 2008 and must be carried out before construction work commences. This also complies with some of the mandatory requirements for SWMPs under The Code for Sustainable Homes.

Site waste management plan administration

A waste champion should be assigned. Depending on the size of the site, someone who has a dual role, such as the site manager, could fulfil this role.

An individual should be responsible for the planning, implementation, monitoring and monthly reporting on the performance of the SWMP. In the case of Project Z, the person responsible for this is also the waste champion. This person should ensure that, where possible, waste materials are minimised through reduction, reuse and recycling. Waste should be disposed of through offsite landfilling and/or incineration if it is not possible to reuse or recycle it. At all times specific information related to waste eg type, quantity, method of waste management should be recorded. The principal contractor's environmental team could also be contacted, if necessary, to assist in the writing of the SWMP.

The project document controller/secretary should centralise and maintain complete records of waste monitoring and waste transfer documentation.

Record of waste management planning meetings

During the SWMP process, the project team (including representatives from the client, trade and logistics contractors, and waste management contractor) should discuss practical methods for waste management throughout the project (good practice template 3). The meetings provide a useful source of local information (including providers of waste management services), a way of sharing waste management experience and exchanging ideas, and an opportunity to discuss appropriate waste management procedures for the SWMP. These meetings should assist in producing a SWMP that is effective and appropriate to the local context.

Guidance on the waste management planning meeting

At this meeting, the points detailed below should be covered:

- What wastes will be produced?
- How are we going to ensure waste is segregated?
- How are we going to reduce waste?

- How do we ensure all contractors segregate waste?
- What uses can we put to the waste?

Suggested agenda for the waste management planning meeting

1. Introduce attendees
2. Outline the 'rules'
3. State the problem – waste
4. Clarify the problem:
    - Waste from enabling works
    - Waste from construction works
    - Known contractors
    - Site layout
    - Monitoring
    - Maintenance of records.
5. Brainstorm – generate ideas (collect ideas: use flip chart or post-it notes)
6. Summarise ideas
7. Rank the ideas on the most likely solution
8. Arrange next waste management planning meeting date (3–6 months)
9. Close meeting.

Suggested attendance

- Client or client representative
- Waste champion
- Waste management contractor
- Trade contractors.

Record of minutes

Minutes of the SWMP meetings should be kept for future reference. All ideas exchanged within the meeting should be recorded and where appropriate investigated by the waste champion as options for the SWMP.

Schedule of next meeting

Set up date for subsequent SWMP meetings.

STEP 2 Responsibility for waste management

Homebuilders Are Us Ltd has completed good practice template 4 (p.74) to map out which party involved in the project is responsible for waste management (see section 4: Procurement of contractors for more information).

Good practice TEMPLATE 4 Responsibility for waste management CD

Site activity/trade-contractor work package	Primary waste stream	Waste management responsibility
Brick and blockwork	Bricks	Homebuilders Are Us Ltd
Building envelope/cladding	Timber, plastic, cardboard, hardcore, rubble and hazardous waste	Homebuilders Are Us Ltd
Canteen activities	Paper, cardboard, metal packaging, plastic crates and packaging, glass and food waste	Waste Are Us Ltd
Demolition and site clearance	Hardcore, spoil, timber and plastics	Demolition Ltd
Dryliners	Plasterboard, metal studwork and insulation offcuts	Homebuilders Are Us Ltd
Foundation and piling	Spoil	Homebuilders Are Us Ltd
Groundworks	Spoil	Groundworks Ltd
Mechanical and electrical (M&E)	Cables, metals, timber, timber cable drums, plastic, cardboard, plastic packaging and hazardous waste	Homebuilders Are Us Ltd
Landscaping and habitat creating/restoration	Topsoil and green waste	Homebuilders Are Us Ltd
Office activities	Paper, cardboard, plastic packaging and general office waste	Waste Are Us Ltd
Removal of site offices, temporary works and final clear away	Timber, hardcore, plastic and office waste	Homebuilders Are Us Ltd
Structure	Bulk concrete	Homebuilders Are Us Ltd
Trades – (joinery, painting, plastering, rendering, plumbing, heating etc)	Timber, paint, renders, cardboard, plastic packaging and special waste	Homebuilders Are Us Ltd

STEP 2 Guidance notes

Responsibility for waste management

The responsibility for site waste management should normally be assigned to one of the parties listed below:

- Principal contractor
- Trade contractor/s (see section 4: Procurement of contractors for more information)
- Waste management contractor (see section 4: Procurement of contractors for more information).

Tender period

At tender stage, all potential trade contractors should demonstrate the following to the principal contractor:

- The steps the contractors will take to minimise waste brought onto the site. Plasterboard, pallets, plastic wrapping and cardboard will be taken back to the product manufacturer via take-back schemes
- How pre-fabricated materials will be maximised in the design
- The waste quantities allowed for each material stream will be identified, including hazardous waste.

Waste management

The principal contractor should employ a waste management contractor or a waste broker. The principal contractor should appoint a waste champion to assist and ensure that all operatives onsite comply with the management of waste.

The principal contractor's responsibilities onsite include, but not limited to, the following:

- Provide a waste compound onsite where containers for segregated and mixed waste are located
- Provide an area for storing materials suitable for reuse
- Monitoring of general site conditions in terms of waste management and ensure that trade contractors keep their work areas safe and tidy
- Where there have been large volumes of waste (from improper storage or damage) of any materials it should be further investigated and a review carried out.

The waste management company's (or equivalent) responsibilities should include, but not be limited to, the following:

- Supply and manage the roll-on roll-off skips, wheelie bins, weighbridge systems and labour at the site's waste compound
- Manage the waste compound
- Ensure correct segregation of waste at the waste compound
- Efficient management and monitoring of waste streams and quantities to ensure maximum reuse and recycling potential
- Maintenance of legal compliance including maintenance of records
- Respond to waste incidents onsite
- Arrangement and delivery of skips
- Report information on waste production and recycling quantities on a weekly and monthly basis.

The trade contractors' main responsibilities should include, but not be limited to, the following:

- Each trade contractor is responsible for maintaining a tidy work area
- Each trade contractor is responsible for engaging in material segregation onsite.

STEP 3 Verifying waste carrier licences and permits

Homebuilders Are Us Ltd has completed good practice template 5 prior to the removal of any waste offsite. It outlines the waste management licences, waste carrier licences and exempt site licences that have been checked and verified for use on Project Z.

STEP 3 Guidance notes

From a legal perspective the principal contractor has a responsibility to dispose of the site waste at a licensed and suitable site under Section 34(1) of the Environmental Protection Act (Duty of Care) Regulations 1991[3.2] and related amendments. Any person who imports, produces, carries, keeps, treats or disposes of controlled waste has a duty of care to manage the waste responsibly. Failure to do this could result in an unlimited fine. As such, both the client and the principal contractor are responsible for maintaining the correct legislative procedures for offsite disposal of all waste on a project. Under The Site Waste Management Plans Regulations 2008,[3.1] the client and the principal contractor must declare that all reasonable steps will be taken to ensure that all waste from the site is managed responsibly, that materials will be handled efficiently and waste managed appropriately. This applies to projects with an estimated cost of greater than £300 000 under The Site Waste Management Plans Regulations 2008 and must be carried out before construction work commences.

Movement of waste offsite must be undertaken with the knowledge that the waste is being:

- Removed by a registered carrier
- Delivered to a facility licensed to accept the waste.

Waste transfer notes

The following information sets out the minimum requirements under the Environmental Protection (Duty of Care) Regulations 1991[3.2] and any amendments for information on all WTNs. It is the legal responsibility of the principal contractor to describe the waste as accurately as possible. The waste carrier must sign the WTN and hand over a copy to the site manager prior to leaving the site.

The principal contractor (not the waste carrier) is responsible for ensuring that the WTN contains the following information:

1. The name of the waste producer
2. Signature of the waste producer
3. Signature of the waste carrier
4. A description of the waste (inert, non-hazardous or hazardous) and the relevant European Waste Catalogue classification
5. The quantity of waste in terms of m^3 (eg 8, 16, 20, 30, 40, 50 m^3)
6. How the waste is stored (eg is the waste loose or is it stored in a skip that is open or lidded and/or is the container a roll-on roll-off bin?)
7. The name of the site where the waste is being created
8. The time that the waste was taken offsite by the waste carrier
9. The name and address of the waste carrier
10. The name and address of where the waste is being taken to, if different from point 9 above. Also, the name of the waste manager receiving the waste should be included

Good practice TEMPLATE 5 Register of waste carrier licences and permits CD

Waste description	Code	Origin of waste	Waste carrier			Disposal site	
			Name	Licence number	Expiry date	Name	Licence number/exemption reference
All construction and demolition waste	17 09 04	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Canteen waste	20 01 08	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Clinical waste	18 01 03 18 01 04	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Hazardous waste	17 03 03	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Muck offsite	17 01 07	Groundworks Ltd		L56789	10/12/08	Groundworks Ltd	LN13333

11. Whether the waste carrier is the producer or carrier of the waste (in most cases it should be the latter)
12. Information confirming that the waste carrier has a waste management licence under section 35 of the Environmental Protection Act 1990 (Duty of Care) Regulations[3.2] or of a disposal licence under section 5 of the Control of Pollution Act 1974[3.5]
13. The certificate number, and the Environment Agency stamp as the authority who issued it, is highlighted on the WTN.

The waste carrier should give the principal contractor a copy of the receipt for all waste transfers, or a copy of the invoice. WTNs must be retained for two years. If the waste is hazardous, a consignment note must be obtained each time the waste is transferred, which must be kept for a minimum of three years under the Environmental Protection Act 1990 (Duty of Care) Regulations.

WTNs and licences should be regularly audited onsite to ensure legal compliance.

STEP 4 Forecasting key waste production

Good practice template 6 has been completed by Homebuilders Are Us Ltd to focus attention on the waste generated throughout the project from enabling works (including demolition) to completion of construction works.

Good practice TEMPLATE 6 Waste production checklist CD

Waste material	Enabling works (including demolition)		Construction works	
	Tick (✔)	Estimated quantity m^3	Tick (✔)	Estimated quantity m^3
Inert waste				
Aggregates	✔	500	✔	200
Brick/blocks	✔	300	✔	200
Ceramics	✔	200	✔	300
Concrete	✔	200	✔	100
Glass	✔	500	✔	50
Gravel	✔	100	✔	20
Sand				
Soils (uncontaminated)	✔	500		
Stone	✔	50		
Tarmac	✔	10	✔	10
Other				
Other				
Other				
Sub-total		1960		1000

Waste material	Enabling works (including demolition)		Construction works	
	Tick (✔)	Estimated quantity m^3	Tick (✔)	Estimated quantity m^3
Non-hazardous waste				
Canteen waste	✔	10	✔	50
Cardboard			✔	100
Metal – offcuts			✔	50
Metal – reinforcement				
Metal – steel			✔	50
Paper			✔	50
Plasterboard			✔	500
Plastics			✔	500
Polystyrene			✔	70
Timber			✔	250
Trees	✔	300		
Vegetation (shrubs, bushes etc)	✔	200		
Other				
Other				
Other				
Sub-total		530		1050
Hazardous waste				
Asbestos	✔	200		
Bulk excavated (contaminated)				
Explosive	✔			50
Flammable				
Soils (contaminated)				
Toxic				
Other				
Other				
Other				
Sub-total		200		50
Total volumes		2690		2100

STEP 4 Guidance notes

Forecasting waste production

Under the Site Waste Management Plans Regulations 2008,[3.1] projects with an estimated cost of over £300 000 must estimate the quantity of each different type of waste that will be produced, and identify the waste management action proposed. Defined waste groups should also be estimated for the stages of the project programme and the waste management options for them need to be considered for The Code for Sustainable Homes.[3.7] This must be carried out before construction work commences.

Completing good practice template 6 should focus attention on the waste generated throughout the project from enabling works (including demolition) to completion of construction works. A best estimate of quantities should be sufficient, and should assist in prioritising the key wastes. The total volumes of wastes during enabling works (including demolition) and construction should be summarised accordingly (tonnes can also be used). A forecast of waste quantities should also be of use when negotiating waste management packages due to the economies of scale. It may also be possible to broker waste to another site requiring material eg crushed concrete. Once completed, this checklist can be used in the tender documentation for waste management contractors.

Waste categories

Waste generated on projects normally falls into three categories (in order of increasing environmental hazard), each containing different waste types depending on the project:

- **Inert waste** – waste that should not harm or cause adverse effects to the environment when disposed of, or does not decompose when buried. It has no potentially hazardous content once placed in landfill, eg rocks, concrete, mortar, bricks, blocks and tiles, plaster (not plasterboard), uncontaminated soils and aggregates and glass
- **Non-hazardous waste** – waste that will break down/decompose when buried, resulting in the production of landfill gases such as methane and carbon dioxide, eg timber, paper, and cardboard, green waste, food and metal
- **Hazardous waste** – waste that is harmful to human health or environment, eg products liable to cause death, injury or impairment to living beings, pollution of waters or unacceptable environmental impact if improperly contained, handled, treated or disposed of. Hazardous waste includes waste with one or more of the following properties:
  - Explosive, oxidising, flammable, highly flammable, irritant, toxic, carcinogenic, corrosive, infectious, teratogenic, mutagenic, ecotoxic (see Table 8 for definitions of hazardous properties)
  - Waste which releases toxic gases in contact with water, air or acid
  - Waste which after disposal produces a leachate or other substances that possess any of the above properties
  - Harmful waste which if it is inhaled or ingested or if it penetrates the skin, may involve limited health risks.

Under The Site Waste Management Plans Regulations 2008, as a minimum, waste types must be identified at these levels (ie inert, non-hazardous and hazardous). Under The Code for Sustainable Homes, groups of waste should be identified as outlined in the technical guidance.[3.7]

TABLE 8

Definitions of hazardous properties

Property	Description	COSHH warning label
Corrosive	Any waste consisting of substances and preparations which may destroy living tissue on contact. For example, products with COSHH warning labels	
Explosive	Waste consisting of substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene and represents products having the following COSHH warning label	
Flammable	Waste that consists of liquid substances and preparations having a flashpoint equal to or greater than 21°C and less than, or equal to, 55°C	
Highly flammable	Waste that consists of: ▪ Liquid substances and preparations having a flashpoint below 21°C ▪ Substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature ▪ Solid substances and preparations which may readily catch fire after brief contact with a source of ignition and which continue to burn ▪ Gaseous substances and preparations which are flammable in air at normal pressure ▪ Any substances and preparations which, in contact with water or damp air evolve highly flammable gases in dangerous quantities	
Infectious	Waste that consists of substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in humans or other living organisms	
Oxidising	Waste that consists of substances and preparations which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances	

STEP 5 Prioritising waste

Good practice template 7 (p.82) has been filled in by Homebuilders Are Us Ltd to aid waste prioritisation for enabling works (including demolition) and good practice template 8 (p.82) has been completed for construction works.

Good practice TEMPLATE 7 Enabling works (including demolition) CD

Waste material	Waste type	Origin of waste
Aggregates	Inert	Demolition
Bricks/blocks	Inert	Demolition
Ceramics	Inert	Demolition
Concrete	Inert	Demolition
Soils	Inert	Site strip
Tarmac	Inert	Site strip
Trees	Non-hazardous	Site strip
Vegetation	Non-hazardous	Site strip

Good practice TEMPLATE 8 Construction works CD

Waste material	Waste type	Origin of waste
Canteen	Non-hazardous	All contractors
Cardboard	Non-hazardous	Fitting out
Ceramics	Inert	Bricklayers
Concrete	Inert	Substructure and superstructure
Metal – steel	Non-hazardous	Superstructure
Plasterboard	Non-hazardous	Drylining
Polystyrene	Inert	Fitting out

STEP 5 Guidance notes

The most significant waste for enabling works (including demolition) and construction works (by volume, weight or cost) should be listed for classification and definition of origin (include up to 10 listed in good practice templates 7 and 8). This will help to focus the SWMP to the site-specific issues of waste and the options for managing it. The origin of the waste should be considered with the means, tools, plant, processes, materials, procedures, training, and site layout to ensure the expected waste is minimised.

The waste champion should monitor the SWMP and disposal procedures.

STEP 6 Planning the reduction, reuse and recycling of waste

Good practice template 9 (p.83) is an example of a SWMP used by Homebuilders Are Us Ltd for planning the minimisation, reuse, recycling and disposal of waste for enabling works (including demolition) and good practice template 10 (p.84) for construction works on Project Z, including the setting of targets as recommended in The Code for Sustainable Homes.[3.7]

Good practice TEMPLATE 9 Record of the reduction, reuse and recycling options of waste for enabling works (including demolition) CD

Waste material	Quantity (m^3)	Target	Trade contractor package	Waste minimisation opportunities	Onsite recycling/reuse	Offsite recycling/reuse	Disposal
Concrete	200	Recycle onsite – 90%	Demolition, piling, concrete frame, groundworks and floors	Pre-fabrication offsite, onsite batcher and plan pours (use surplus for blinding)	Excess material can be dried and reused onsite as backfill	Segregate, reprocessed and reused in construction industry	Landfill and cover
Glass	100	Recycle onsite (with hardcore) – 90%	Demolition			Segregate waste and send for recycling	Landfill
Green waste/ vegetation	500	Recycle offsite – 80%	Earthwork, demolition and landscaping	Excavate and re-plant larger specimens (trees)	Chip onsite for landscaping	Segregate, send for composting and use as mulch on land	Landfill
Hazardous waste (asbestos)			Demolition and strip out	N/A	N/A	N/A	Landfill
Hazardous waste (contaminated land)			Earthworks, groundworks	Contain in situ	Remediate onsite and reuse material	Remediate offsite	Landfill
Hazardous waste (other)							Landfill
Metal			Steel frame, temporary works, concrete frame, decking and roofing	Pre-fabrication, correct ordering, just-in-time delivery and store correctly	Reused in temporary works	Segregate waste and send to metal recycler	Landfill
Pallets			Cladding, brick and blockwork	Return pallet to supplier or use plastic pallets	Reuse pallets for internal storage and movement of materials	Send pallets for reuse	Landfill
Plasterboard			Demolition	N/A	Cannot reuse	N/A	Landfill
Rubble (hardcore)	500	Recycle onsite – 90%	Demolition, brick and blockwork	Using part of the existing structure in original form within completed construction	Use as hardcore onsite	Segregate, land reclamation, reprocessed and reused in construction industry	Landfill and cover
Soils	500	Reuse offsite – 100%	Piling, groundwork and earthworks	Store onsite	Reuse in landscaping and use as backfill	Land reclamation	Landfill and cover
Timber			Concrete frame, groundworks and joinery	Use steel shuttering and reuse all shuttering	Reuse for shuttering, temporary hoardings and general carpentry	Segregate for chipping to use in other timber construction products	Landfill
Totals	1800						

Good practice TEMPLATE 10 Record of the reduction, reuse and recycling options of waste for construction works CD

Waste material	Quantity (m^3)	Target	Trade contractor package	Waste minimisation opportunities	Onsite recycling/reuse	Offsite recycling/reuse	Disposal
Cable wiring	10	Recycle 100%				Segregated and send for recycling in order to recover high value metals	Landfill
Canteen	25	Compost 20%	Canteen and logistics	Use reusable crockery and cutlery	Compost for landscaping (must be kept separate from other waste and stored in closed top bins)	Send for composting (food waste only)	Landfill
Green waste/ vegetation			Earthwork, demolition and landscaping	Excavate and re-plant larger specimens (trees)	Chip onsite for landscaping	Segregate, send for composting and use as mulch on land	Landfill
Hazardous waste (paint tins, line markers and mastic)	50		All trades	Use solvent free paints that are not disposed of as hazardous waste and maximise use of mechanical fitting rather than adhesives	Use a lockable COSHH container for storage	Incinerator/landfill	
Hazardous waste (other)							Landfill
Insulation	50						Landfill
Metal	50	Recycle offsite – 100%	Steel frame, temporary works, concrete frame, decking and roofing	Pre-fabrication, correct ordering, just-in-time delivery and store correctly	Reused in temporary works	Segregate waste and send to metal recycler	Landfill
Mixed waste	100	Recycle 50%	All trades	Pre-assembly and fabrication offsite		Send to transfer station for further segregation	Landfill
Office	25	Recycle 50%	Site management and major packages	Print double sided, send documents electronically and non-disposable cups	Reuse paper, cartridges, plastic cups, tins and cardboard	Segregate and recycle white paper	Landfill
Packaging	150	Recycle 50%	M&E, fit-out, cladding	Ask suppliers to send product with minimal packaging, reusable containers and buy in bulk not individually wrapped products		Segregate cardboard, pallets and plastic for recycling	Landfill
Pallets	20	Reuse 100%	Cladding, brick and blockwork	Return pallet to supplier or use plastic pallets	Reuse pallets for internal storage and movement of materials	Send pallets for reuse	Landfill
Plasterboard	500	Recycle 100%	Dry lining	Procure to design specifications and store in a dry area	Keep in dedicated storage place for offcuts to reuse	Send back to plasterboard manufacturer	Landfill
Timber	300	Recycle offsite – 60%	Concrete frame, groundworks and joinery	Use steel shuttering and reuse all shuttering	Reuse for shuttering, temporary hoardings and general carpentry	Segregate for chipping to use in other timber construction products	Landfill
Totals	1170						

STEP 6 Guidance notes

Good practice templates 11, 12 and 13 (p.86) show the possible waste management options for waste materials generated onsite.

Good practice TEMPLATE 11 Waste management options for inert waste CD

Waste material	Reduce	Reuse	Recycle/scrap	Landfill	Incinerate	Other
Aggregates	Use crushed concrete	Hardcore and fill				
Brick/blocks	Return damaged materials to supplier					
Concrete	Specify correct volume required	Hardcore and fill	Crushed for aggregate			
Glass	Examine storage and handling	Use glass as aggregate replacement in tarmac				
Gravel	Specify correct volume required		Sell to building contractor			
Rock			Sell to building contractor	Final option	Final option	
Sand	Specify correct volume required		Sell to building contractor			
Soils (uncontaminated)	Segregation during excavation	Land balancing – use as landfill cover	Sold as cover material			
Tarmac	Use glass as aggregate replacement	Planings in new tarmac				

Good practice TEMPLATE 12 Waste management options for non-hazardous waste CD

Waste material	Reduce	Reuse	Recycle/scrap	Landfill	Incinerate	Other
Canteen waste			Animal feed via compost contractor			
Cardboard	Return packaging to supplier		Collect and use compactor and bailer			
Gypsum products			Return waste to supplier			
Metals – reinforcement	Pre-cut to specification		Scrap merchant			
Metals – steel			Scrap merchant			
Metal – offcuts	Pre-cut to specification		Scrap merchant			
Paper	Double-sided print Circulate documents	Scrap notepaper	Recycle contractor			
Plasterboard	Pre-cut to specification Storage Handling		Return waste to supplier	Final options	Final options	
Plastic	Return packaging to supplier				Energy recovery	
Timber	Pre-cut to specification	Shuttering for temporary cable protection and road humps	Pallets (deposit/return) Sale of flooring and support to scrap merchant			
Trees	Incorporate into landscape design	Mulch Landscaping cover	Compost contractor			
Vegetation		Compost contractor	Compost onsite			

Good practice TEMPLATE 13 Waste management options for hazardous waste CD

Waste material	Reduce	Reuse	Recycle/scrap	Landfill	Incinerate	Other
Asbestos	Specialist contractor	Specialist contractor	Specialist contractor			
Explosive	Producer responsibility	Producer responsibility	Producer responsibility			
Flammable	Producer responsibility	Producer responsibility	Producer responsibility			
Soil (contaminated)	Segregation during excavation	Decontaminated prior to reuse	Sold as landfill cover material (depending on level)			
Topsoil (contaminated)	Segregation during excavation	Decontaminated prior to reuse	Sold as landfill cover material (depending on level)	Final options	Final options	
Toxic	Producer responsibility	Producer responsibility	Producer responsibility			

Planning for waste management onsite

Planned delivery/material take-back

Just-in-time delivery of materials arriving to site should be set up in order to prevent damage as a result of inadequate storage and weather conditions. Investigate the option of returning packaging and offcuts of materials to the manufacturers of these materials. Suppliers may also have details on suitable waste management contractors that can specifically deal with waste arising from their products/materials.

Identifying waste management options

Investigate waste management options with local and national waste management contractors and find out if they are willing to go into partnership. The principal contractor should either: segregate and recycle wastes or reuse waste. Offsite disposal to landfill or offsite incineration (combustion) should be considered as the last option. Follow the appropriate selection criteria. (Trade contractors should provide details of how they will reduce, reuse and recycle waste.)

Sharing services with other sites

Find out if there are other sites nearby and see if the waste management contract could be shared. This would also provide economies of scale for material take-back schemes.

STEP 7 Costing waste management

Homebuilders Are Us Ltd has used best practice template 14 to record waste management costs.

Good practice TEMPLATE 14 Waste management costs CD

Waste material	Waste management contractor details	Waste management activity	Forecast total m^3 or tonnages	Unit price paid £		Cost £ (+/-)
				(price paid per m^3 or tonnes to waste management contractor)	(price gained per m^3 or tonnes for selling materials or reusing materials onsite)	
Enabling works (incl. demolition)						
Concrete	Demolition Ltd	Reuse onsite	200		2	-400
Hardcore	Demolition Ltd	Recycle onsite	500		2	-1000
Timber		Recycle onsite	0			
Soils	Groundworks Ltd	Reuse onsite	500	4		2000
					Subtotal	600
Construction works						
Hardcore	Waste Are Us Ltd	Recycle	400			-800
Hazardous waste	Waste Are Us Ltd	Landfill	50	15		750
Metals	Waste Are Us Ltd	Recycle	50		10	-500
Packaging	Waste Are Us Ltd	Recycle	150	8		1200
Plasterboard	Waste Are Us Ltd	Take-back	500		1	-500
Timber	Waste Are Us Ltd	Recycle	300	5		1500
					Subtotal	1650
					Overall total	2250

STEP 7 Guidance notes

The principal contractor should record and keep contact details of the waste management contractors, their provisions and the commercial rates for the services they provide. If the waste has a scrap value, the principal contractor could pay the construction project for the waste (recorded as a credit), or take the waste free of charge. The value of some waste should be considered during waste management package negotiations as the waste management contractors may gain a resale value for the waste.

Ideally, waste management contractors should specifically deal with the key wastes as identified during the planning stage. The waste management package should specify: return to supplier, reuse, recycle/scrap, landfill, incinerate or other (specify). The details should be provided for the entire project ie enabling works (including demolition) and construction works.

Using the waste forecasts and the waste management contractors' rates then the total estimated waste costs can be calculated. The sub-totalled costs should be provided for both enabling works (including demolition) and construction works. The sub-totals can be added to provide a total forecast waste cost expressed in pounds (£).

STEP 8 Preparation checklist

Homebuilders Are Us Ltd has used good practice template 15 to make sure that all the steps have been taken to implement the good practice SWMP.

Good practice TEMPLATE 15 Preparation checklist CD

Checks (please tick)	Yes	No
1. Has administration and planning been fully completed?	✔	
2. For offsite waste management or disposal are all the waste destination details verified?	✔	
3. Have all the key wastes been forecasted and prioritised?	✔	
4. Have reuse/recycling/disposal options been identified for the waste?	✔	
5. Have terms and commercial rates been agreed with the waste management contractor(s)?	✔	
6. Have data reporting procedures been agreed with the waste management contractor(s)?	✔	
7. Has a waste segregation/collection area been prepared?	✔	
8. Has the SWMP area been adequately signposted?	✔	
9. Has the SWMP planning meeting been set?	✔	
10. Has the SWMP document control/filing system been set up?	✔	
11. Have all necessary staff and contractors read and signed the SWMP?	✔	
12. Have all the SWMP training/briefing requirements for contractor/s been met?	✔	
13. Have the waste management targets/KPIs been set?	✔	
14. Has the SWMP been approved by the project manager?	✔	

Comments/further actions
1.
2.
3.

Revisions		
Nature of revision	**Date of revision**	**Owner of revision**
Meeting with the client and demolition contractor – changed some of the waste management actions	10/07/08	Sue Jones

STEP 8 Guidance notes

Prior to implementing the SWMP, the waste champion should complete all necessary checks using the checklist (good practice template 15) to ensure the effective operation, monitoring and reporting of the SWMP.

STEP 9 Implementing the site waste management plan

The SWMP should be implemented as soon as construction work commences. Good practice template 16 (p.90) shows how Homebuilders Are Us Ltd has recorded waste management information. The key elements of the implementation are:

Setting up the contract

- Set minimum contract terms, commercial rates and document controls with waste management contractors
- Define disposal routes, address and contact details of waste destination.
- Ensure there is a document filing system.

Site set-up

Staff should read the SWMP (as required).

- Ensure all contractors are briefed on the SWMP and training provided if the contractor requires
- Place signage around the site to ensure that waste collection points are clearly marked for contractors.

Waste Aware Construction provides signage for a nationally agreed colour coding scheme which is freely available through its website as editable PDFs. The signs are a simple and effective way to promote streaming and segregating of construction waste at source. The signs are available at www.wasteawareconstruction.com (Figure 10).

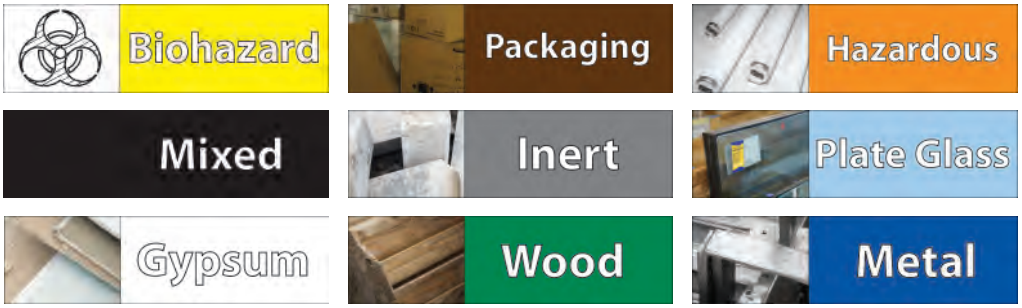


Figure 10 Colour coded signage to identify waste collection points.

Good practice TEMPLATE 16 Record of waste management information CD

Date removed	Waste type	Identity of waste removal company	Site the waste is being taken to and whether licensed or exempt	Waste carrier and registration number	Confirmation of delivery	Waste management route (reused on/offsite, recycled on/offsite, recovery, landfill, otherwise disposed)
11/07/08	Inert	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678123	Recycled offsite
16/07/08	Inert	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678124	Recycled offsite
18/07/08	Mixed non-hazardous	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678125	Recovery – sorted offsite by waste management contractor
01/08/08	Mixed non-hazardous	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678126	Recovery – sorted offsite by waste management contractor
15/08/08	Mixed non-hazardous	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678127	Recovery – sorted offsite by waste management contractor

Good practice template 16 shows how Homebuilders Are Us Ltd has recorded waste management information.

For projects with an estimated project cost of greater than £300 000, the identity of the waste removal company removing the waste, the types of waste removed and the site the waste is being taken to must be recorded. For projects greater than £500 000, extra information must be recorded including:

- The types and quantities of waste produced.
- The types and quantities of waste that have been:
  - Reused (on or offsite)
  - Recycled (on or offsite)
  - Recovered (on or offsite)
  - Landfilled
  - Otherwise disposed of.

For the mandatory element in The Code for Sustainable Homes,[3.7] confirmation is required that the waste is being monitored and the amount of waste per waste type should be measured. For example, an established system such as BRE's SMARTWaste Plan can be used (www.smartwaste.co.uk).

Good practice template 17 is an example of how to record the above information.

Good practice TEMPLATE 17 Types and quantities (estimated in m^3 or tonnes) of waste and its management CD

Waste type	Waste material	Reuse onsite	Reuse offsite	Recycling onsite	Recycling offsite	Other form of recovery onsite	Other form of recovery offsite	Sent to landfill	Other disposal
Inert	Concrete	12	3						
	Rubble (hardcore)								
Non-hazardous	Cable and wiring								
	Glass								
	Metal						10		
	Mixed waste								
	Office/canteen								
	Packaging								
	Plasterboard								
	Timber			5					
	Other								
Hazardous	Asbestos							10	
	Contaminated land								
	Paint tins, line markers and mastic							0.05	

STEP 9 Guidance notes

Information should be obtained from the waste management contractor to record what happens to the waste once it is removed offsite. The principal contractor may also want to record the type and amount of waste that is generated onsite. If the waste is recovered onsite then this also should be included in the SWMP. These templates (good practice templates 16 and 17) should be completed at least every six months. Targets set should also be monitored.

Other areas of implementation should include:

- Appropriate training for site staff
- Regular review of the SWMP through meetings etc
- Communication of the SWMP to site staff.

The SWMP should be kept onsite and be available to any trade contractor carrying out work described in the SWMP.

STEP 10 Reviewing the site waste management plan

An important part of managing a SWMP is to review how waste has been managed throughout the project. Good practice template 18 is an example of a SWMP review that has been completed by Homebuilders Are Us Ltd.

Good practice TEMPLATE 18 Review of waste information CD

Waste material	Estimated quantity (m^3)	Actual quantity (m^3)	Difference (+/-)	Reason for variance
Enabling works (including demolition)				
Concrete	200	250	+50	More concrete than anticipated in demolition of structure
Glass	100	100	0	
Green waste/vegetation	500	600	+100	More vegetation than expected
Hazardous waste (asbestos)	200	200	0	
Hazardous waste (contaminated land)	0		0	
Hazardous waste (other)	0		0	
Metal	0	50	+50	Metal was missing from initial forecast
Pallets	0	0	0	
Plasterboard	0	0	0	
Rubble (hardcore)	800	700	-100	Less hardcore (from bricks/blocks from demolition)
Soils	500	500	0	
Timber	0	20	+20	Timber was missing from initial forecast
Construction works				
Cable wiring	10	8	-2	More efficient use of materials
Canteen	25	25	0	
Green waste/vegetation	0	0	0	
Hazardous waste (paint tins, line markers and mastic)	50	50	0	
Hazardous waste (other)				

Waste material	Estimated quantity (m^3)	Actual quantity (m^3)	Difference (+/-)	Reason for variance
Construction works (continued)				
Insulation	50	60	+10	Rework had to be undertaken
Metal	50	40	-10	Less metal due to more efficient use of materials
Mixed waste	100	100	0	
Office	25	25	0	
Packaging	150	200	+50	More packaging generated from fit-out stages
Pallets	20	30	+10	More materials supplied on pallets than originally thought
Plasterboard	500	400	-100	Standard sizes used
Timber	250	220	-30	Less timber due to better ordering of materials

Deviations from the SWMP and cost savings:

STEP 10 Guidance notes

- Compare the estimations of waste with the actual waste arisings and note down the reasons for any variance
- Use these figures as a basis for your next SWMP
- Record lessons learned from writing and implementing the SWMP and recommendations
- Record lessons learned (good practice template 19)
- Write down any cost savings from implementing the SWMP (this is a legal requirement for projects with costs greater than £500 000).

Good practice TEMPLATE 19 Lessons learned CD

1.	Ensure forecast of waste quantities and types is carried out in sufficient detail
2.	Look at reducing packaging from fit-out stages by talking to suppliers/trade contractors
3.	
4.	

Part 3: Best practice

Construction projects with an estimated project cost of greater than £300 000 are required to prepare, implement and review a site waste management plan under The Site Waste Management Plans Regulations 2008.[3.1]

Best practice guidance and templates described in this section comply with and go beyond the Regulations for all projects and the credits available for site waste management in The Code for Sustainable Homes.[3.7] Additional benefits can include cost savings, enhanced corporate social responsibility and improved efficiency. The guidance and templates are applicable to all projects across the UK.

Adopting best practice is *leading edge or providing an exceptional model, approach or strategy* using the most effective mechanism to achieve the required goals. A best practice SWMP should be developed at the project inception stage and should include a detailed consideration of all waste streams prior to the commencement of site works, to provide the optimum balance of resource efficiency, reuse and recycling. The best practice SWMP considers the waste hierarchy in full (Figure 1) and emphasises options to reduce waste in the project design and delivery stages. Just-in-time deliveries along with effective working practices will minimise waste generation, and designated responsibilities for waste management are defined. All staff should be actively encouraged to engage in the process, receive by training and incentives should be provided to minimise waste generation. Monitoring and measurement of waste should be ongoing, along with regular interpretation to identify trends and wasteful practices.

Figure 11 The steps in a best practice site waste management plan.

Figure 11 shows the steps involved in a best practice SWMP.

Consider the following points before writing and implementing a best practice SWMP.

3.5 Legal compliance and minimum standards

3.5.1 Legal compliance

Duty of Care practices (under the Duty of Care Regulations 1991[3.2] and Duty of Care code of practice)[3.3] should be audited periodically onsite. These practices should include:

- Providing waste transfer notes (WTNs) for inspection
- Site registration for production of hazardous waste

- Providing consignment notes for hazardous waste for inspection
- Checking the waste carrier's licence
- Checking the waste transfer station licence
- Checking waste exemptions/licences.

3.5.2 Responsible person

An individual should be appointed as overall waste champion and be present on the site at all times. An individual should also be appointed for writing and implementing the SWMP (this could be the responsibility of the waste champion but it could also be given to a more appropriate person, such as the project manager). Responsibility should also be given to named individuals for each waste type per work package.

3.5.3 Waste management contractors

A partnership approach should be sought with the waste management contractor, enabling opportunities for higher levels of recycling. A recycling target with a waste management contractor should be agreed at the start of the project. The waste contractor should be audited periodically by the principal contractor. (See section 4: Procurement of contractors for more information.)

3.5.4 Trade contractors

Waste minimisation issues should be considered when tendering for work. Clauses should be included in the contract documentation to require trade contractors to participate in waste minimisation and material segregation and meet targets, which should be reviewed regularly. Trade contractors should supply information on the types and amounts of waste they are likely to produce and feed this into the SWMP. (See section 4: Procurement of contractors for more information.)

3.5.5 Waste minimisation

A best practice SWMP should include consideration of the waste hierarchy (see Figure 1). Waste minimisation issues should be considered during the design stage of the project and targets should be set to reduce waste onsite.

3.5.6 Identification of waste arisings and disposal routes

Identification of waste arisings and options for reduction, reuse and recycling should be addressed before the start of the project. This should be done for waste types and amounts and be related to the work package. If demolition occurs, then a pre-demolition audit should be undertaken which should follow an appropriate methodology eg the Demolition Protocol (www.aggregain.org.uk). Recommendations to manage resources more effectively from demolition should feed into the SWMP, perhaps linked to resource requirements in the construction phase of the project.

3.5.7 Supply chain

Ordering pre-sized materials and just-in-time delivery should be practised onsite. Take-back schemes for excess materials, eg pallets, as well as packaging, should be set-up onsite. The construction programme should intentionally source materials with a recycled content.

3.5.8 Site implementation

The site manager/waste champion should implement and review waste management activities onsite. The layout and skip location should be considered at the design stage. Labelling and colour coding of skips (see Figure 12 on page 119) should be used for different material streams that will be segregated onsite (if space permits). Segregated containers should be used at the workface and compactors/balers used where appropriate. Materials should be stored onsite appropriately to avoid material wastage due to inadequate storage. Just-in-time deliveries should be implemented and double handling avoided.

The reuse of concrete waste and other potential waste fill materials (either onsite or offsite) should be practised. A reuse area could also be set-up for other materials. Waste (if space is available) should be segregated into the following steams for offsite recycling:

- Metal
- Wood
- Inert
- Mixed/general construction waste (non-hazardous)
- Packaging
- Plasterboard (and other major waste streams).

The site manager/waste champion should endeavour to achieve the highest level of material recovery feasible, but which currently bears a cost premium or faces technical constraints. Research carried out by WRAP[3.4] recommends that sites operating best practice should achieve material recovery rates as shown in Table 9.

TABLE 9

Recovery rate of waste materials for best practice onsite

Waste material	Best practice recovery (%)
Cement	99
Ceramics	100
Concrete	100
Electrical equipment	95*
Furniture	50
Hazardous	Limited information
Inert	100
Insulation	75
Liquids and oils	100
Metals	100
Packaging	95
Plasterboard	95
Plastics	95
Timber	95
Miscellaneous	75

* This is a required target for the type of predicted waste from electrical and electronic equipment from construction sites, eg lighting as part of the Waste Electrical and Electronic (WEEE) Regulations.[3.6]

3.5.9 Training

Training on waste segregation, reuse and recycling should be delivered to all trade contractors and operatives on the project during site inductions and toolbox talks. Specific training relating to environmental issues onsite for key staff should be delivered and feedback should be welcomed with appropriate incentives put in place.

3.5.10 Monitoring

The amount and type of waste generated should be measured, monitored and waste minimisation/reduction targets should be set, as well as the volume/tonnage of materials diverted from landfill. KPIs set by the client or principal contractor should be complied with. The site waste targets should be reviewed at regular intervals (ie quarterly/monthly).

3.5.11 Community activities

Linking with local community groups to establish reuse and recycling opportunities and the Considerate Contractor Scheme should be used. Transferring best practice and knowledge sharing networks could also be instigated.

3.6 Implementing best practice

A fictitious construction project has been used in the following pages (Project Z) to illustrate how to implement a best practice SWMP for each of the steps shown in

Figure 11. The best practice templates that follow can be used to compile a best practice SWMP for actual projects. General guidance on how to implement the steps is given after the details of each step.

STEP 1 Administration and planning

Best practice templates 1, 2 and 3 (p.100) have been completed by Homebuilders Are Us Ltd to log key information about the project.

Best practice TEMPLATE 1 Project information CD

Client	Excellent Housing Ltd					
Principal contractor	Homebuilders Are Us Ltd					
Project manager	Alex Smith					
Author of the SWMP	Sue Jones					
Project title/reference	Project Z					
Project location	123 High Street, Nowhere					
Project cost (estimated)	£1.5 million					
Building footprint (m^2)	50 000 m^2					
No. of dwellings	40		m^2 per dwelling		80	
Start date	Day	01	Month	07	Year	2008
Completion date	Day	01	Month	12	Year	2009
Description of project scope (please tick)	Demolition		✔	Brick and block		✔
	Timber frame construction			Modern methods of construction		
	Concrete frame construction		✔	Other (describe)		
Waste minimisation statement	At Project Z, we have considered waste minimisation at a very early stage. This includes using standard sizes for plasterboard, elements of offsite fabrication and close working with our supply chain to avoid over ordering materials and reduce excessive packaging. We will seek to reuse materials onsite wherever feasible and excess materials will be sent back to suppliers. A waste reduction target will be set for the project and trade contractors will have to meet reduced wastage rates for certain materials					
Waste champion	Sue Jones					
Version number and date (update as necessary)	V2. 10/07/2008					

Best practice TEMPLATE 2 Waste management project administration CD

Position	Name	Contact details
Client	Ian Reynolds	Tel: 0800 900 000
Client waste management representative (if applicable)	N/A	N/A
Project manager	Alex Smith	Tel: 0800 100 000
Waste champion	Sue Jones	Tel: 0800 200 000
Document controller/secretary	Tom Elliot	Tel: 0800 300 000

Best practice TEMPLATE 3 Record of waste management planning meetings CD

Date	Organiser	Attendance record (name and company)	Notes taken by
08/07/2008	Sue Jones	Ian Reynolds – Excellent Housing Ltd Alex Smith – Homebuilders Are Us Ltd Tom Elliot – Homebuilders Are Us Ltd Frank Swan – Demolition Ltd	Sue Jones

STEP 1 Guidance notes

Project description

Best practice templates 1, 2 and 3 can be used to provide key information about waste minimisation, including examples.

Key facts have been recorded for the SWMP. Under The Site Waste Management Plans 2008[3.1] it is requirement to record details of the client, the principal contractor, the person who drafted the SWMP, a description of the construction works including the location of the site and the estimated cost. Any decisions taken on waste minimisation in relation to project nature, design, construction method and materials employed also have to be recorded. This is a requirement for all projects with an estimated project cost greater than £300 000 under The Site Waste Management Plans Regulations 2008[3.1] and must be carried out before construction work commences. This also complies with the mandatory requirements for SWMPs under The Code for Sustainable Homes.

Site waste management plan administration

A waste champion should be assigned. Depending on the size of the site the role could be fulfilled by someone who has a dual role, such as the site manager.

An individual should be responsible for the planning, implementation, monitoring and monthly reporting on the performance of the SWMP. In the case of Project Z, the person responsible for this is also the waste champion. This person should ensure that, where possible, waste materials are minimised through reduction, reuse and recycling. Waste should only be disposed of through offsite landfilling and/or incineration if it is not possible to reuse or recycle it. At all times specific information related to waste eg type, quantity, and method of waste management should be recorded. The principal contractor's environmental team could also be contacted, if necessary, to assist in the writing of the SWMP.

The project document controller/secretary should centralise and maintain complete records of waste monitoring and waste transfer documentation. The client or client representative should be consulted in the creation of the SWMP.

Record of waste management planning meetings

During the SWMP process, the project team (including representatives from the client, trade and logistics contractors, and waste management contractor) should discuss practical methods for waste management throughout the project (best practice template 3). The meetings provide a useful source of local information (including providers of waste management services), a way of sharing waste management experience and exchanging ideas, and an opportunity to discuss appropriate waste management procedures for the SWMP. These meetings should assist in producing a SWMP that is effective and appropriate to the local context.

Guidance on the waste management planning meeting

At this meeting try to cover the points detailed below:

- What wastes will be produced?
- How are we going to ensure waste is segregated?

- How are we going to reduce waste?
- How do we ensure all contractors segregate waste?
- What uses can we put to the waste?

Suggested agenda for the waste management planning meeting

1. Introduce attendees
2. Outline the 'rules'
3. State the problem – waste
4. Clarify the problem:
    - Waste from enabling works
    - Waste from construction works
    - Known contractors
    - Site layout
    - Monitoring
    - Maintenance of records.
5. Brainstorm – generate ideas (collect ideas: use flip chart or post-it notes)
6. Summarise ideas
7. Rank the ideas on the most likely solution
8. Arrange next waste management planning meeting date (3–6 months)
9. Close meeting.

Suggested attendance

- Client or client representative
- Waste champion
- Waste management contractor
- Trade contractors.

Record of minutes

Minutes of the SWMP meetings should be kept for future reference. All ideas exchanged within the meeting should be recorded and where appropriate investigated by the waste champion as options for the SWMP.

Schedule of next meeting

Set up date for consequent SWMP meetings.

STEP 2 Waste reduction

Homebuilders Are Us Ltd has completed best practice template 4 (on page 102) to confirm its actions for reducing waste onsite.

Best practice TEMPLATE 4 Waste reduction CD

Overall waste reduction target:

The development will not produce more than 16 m^3 of waste per 100 m^2 of floor area

Key waste groups	Waste reduction activities
Bricks	Reduce wastage rate by 2%
Packaging	Return packaging to suppliers
Plasterboard	Design to standard sizes

Best practice TEMPLATE 5 Responsibility for waste management CD

Site activity/trade contractor work package	Primary waste stream	Waste management responsibility
Brick and blockwork	Bricks	Homebuilders Are Us Ltd
Building envelope/cladding	Timber, plastic, cardboard, hardcore, rubble and hazardous waste	Homebuilders Are Us Ltd
Canteen activities	Paper, cardboard, metal packaging, plastic crates and packaging, glass and food waste	Waste Are Us Ltd
Demolition and site clearance	Hardcore, spoil, timber and plastics	Demolition Ltd
Dryliners	Plasterboard, metal studwork and insulation offcuts	Homebuilders Are Us Ltd
Foundation and piling	Spoil	Homebuilders Are Us Ltd
Groundworks	Spoil	Groundworks Ltd
Mechanical and electrical (M&E)	Cables, metals, timber, timber cable drums, plastic, cardboard, plastic packaging and hazardous waste	Homebuilders Are Us Ltd
Landscaping and habitat creating/restoration	Topsoil and green waste	Homebuilders Are Us Ltd
Office activities	Paper, cardboard, plastic packaging and general office waste	Waste Are Us Ltd
Removal of site offices, temporary works and final clear away	Timber, hardcore, plastic and office waste	Homebuilders Are Us Ltd
Structure	Bulk concrete	Homebuilders Are Us Ltd
Trades – (joinery, painting, plastering, rendering, plumbing, heating etc)	Timber, paint, renders, cardboard, plastic packaging and special waste	Homebuilders Are Us Ltd

STEP 2 Guidance notes

To achieve a credit under The Code for Sustainable Homes, confirmation that targets have been set to reduce waste generated onsite should be evident – targets using KPI benchmarks can be used. In addition, at least three key waste groups which have been identified should have clearly defined waste reduction actions; these should be reviewed throughout the construction programme.

STEP 3 Responsibility for waste management

Homebuilders Are Us Ltd has completed best practice template 5 to map out which party involved in the project is responsible for waste management. (See section 4: Procurement of contractors for more information.)

STEP 3 Guidance notes

Responsibility for waste management

The responsibility for site waste management should normally be assigned to one of the parties listed below:

- Principal contractor
- Waste management contractor (see section 4: Procurement of contractors for more information).
- Trade contractor/s (see section 4: Procurement of contractors for more information)

Tender period

At tender stage, all potential trade contractors should demonstrate the following to the principal contractor:

- The steps the contractors will take to minimise waste brought onto the site. Plasterboard, pallets, plastic wrapping and cardboard will be taken back to the product manufacturer via take-back schemes
- How pre-fabricated materials will be maximised in the design
- The waste quantities allowed for each material stream will be identified, including hazardous waste.

Waste management

A waste management contractor or a waste broker should be employed directly by the principal contractor. The principal contractor should appoint a waste champion to assist and ensure that all operatives onsite comply with the management of waste.

The principal contractor's responsibilities onsite include, but not limited to, the following:

- Providing a waste compound onsite where segregated materials for onsite reuse or offsite recycling can be stored
- Monitor general site conditions in terms of waste management and ensure that trade contractors keep their work areas safe and tidy
- Where there have been large volumes of waste (from improper storage or damage) of any materials it should be further investigated and a review carried out.

The waste management contractor's responsibilities should include, but not be limited to, the following:

- Supply and manage the roll-on roll-off skips, wheelie bins, weighbridge systems and labour at the site's waste compound
- Manage the waste compound
- Ensure correct segregation of waste at the waste compound
- Efficient management and monitoring of waste streams and quantities to ensure maximum reuse and recycling potential

- Maintenance of legal compliance including maintenance of records
- Respond to waste incidents onsite
- Arrangement and delivery of skips
- Report information on waste production and recycling quantities on a weekly and monthly basis.

The trade contractor's main responsibilities should include, but not be limited to, the following:

- Each trade contractor is responsible for maintaining a tidy work area
- Each trade contractor is responsible for engaging in material segregation onsite.

STEP 4 Verifying waste carrier licences and permits

Homebuilders Are Us Ltd has completed best practice template 6 prior to the removal of any waste offsite. It outlines the waste management licences, waste carrier licences and exempt site licences that have been checked and verified for use on Project Z.

Best practice TEMPLATE 6 Register of waste carrier licences and permits CD

Waste description	Code	Origin of waste	Waste carrier			Disposal site	
			Name	Licence number	Expiry date	Name	Licence number/exemption reference
All construction and demolition waste	17 09 04	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Canteen waste	20 01 08	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Clinical waste	18 01 03 18 01 04	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Hazardous waste	17 03 03	All contractors	Waste Are Us Ltd	L99999	15/01/09	Waste Are Us Ltd transfer station	LN12345
Muck offsite	17 01 07	Groundworks Ltd		L56789	10/12/08	Groundworks Ltd	LN13333

STEP 4 Guidance notes

From a legal perspective the principal contractor has a responsibility to dispose of the site waste at a licensed and suitable site under Section 34(1) of the Environmental Protection Act (Duty of Care) Regulations 1991[3.2] and related amendments. Any person who imports, produces, carries, keeps, treats or disposes of controlled waste must manage the waste responsibly. Failure to do this could result in an unlimited fine. As such, both the client and the principal contractor are responsible for maintaining the correct legislative procedures for offsite disposal of all waste on a project. Under The Site Waste Management Plans Regulations 2008,[3.1] the client and principal contractor must declare that all reasonable steps will be taken to ensure that all waste from the site is managed responsibly, and that materials will be handled efficiently and waste managed appropriately. This applies to projects with an estimated cost of greater than £300 000 under The Site Waste Management Plans Regulations 2008 and must be carried out before construction work commences.

Movement of waste offsite must be undertaken with the knowledge that the waste is being:

- Removed by a registered carrier
- Delivered to a facility licensed to accept the waste.

Waste transfer notes

The following information sets out the minimum requirements under the Environmental Protection (Duty of Care) Regulations 1991 and any amendments for information on all WTNs. It is the legal responsibility of the principal contractor to describe the waste as accurately as possible. The waste carrier must sign the WTN and hand over a copy to the site manager prior to leaving the site.

The principal contractor (not the waste carrier) is responsible for ensuring that the WTN contains the following information:

1. The name of the waste producer
2. Signature of the waste producer
3. Signature of the waste carrier
4. A description of the waste (inert, non-hazardous or hazardous) and the relevant European Waste Catalogue classification
5. The quantity of waste in terms of m^3 (eg 8, 16, 20, 30, 40, 50 m^3)
6. How the waste is stored (eg is the waste loose or is it stored in a skip that is open or lidded and/or is the container a roll-on roll-off bin?)
7. The name of the site where the waste is being created
8. The time that the waste was taken offsite by the waste carrier
9. The name and address of the waste carrier
10. The name and address of where the waste is being taken to, if different from point 9 above. Also, the name of the waste champion/facility receiving the waste should be included
11. Whether the waste carrier is the producer or carrier of the waste (in most cases it should be the latter)
12. The information confirming that the waste carrier has a waste management licence under section 35 of the Environmental Protection Act 1990 (Duty of Care) Regulations[3.2] or a disposal licence under section 5 of the Control of Pollution Act 1974[3.5]
13. The certificate number, and the Environment Agency stamp as the authority who issued it, is highlighted on the WTN.

The waste carrier should give the principal contractor a copy of the receipt for all waste transfers, or a copy of the invoice. WTNs must be retained for two years. If the waste is hazardous, a consignment note must be obtained each time the waste is transferred, which must be kept for a minimum of three years under the Environmental Protection Act 1990 (Duty of Care) Regulations.

WTNs and licences should be regularly audited onsite to ensure legal compliance.

STEP 5 Forecasting key waste production

Best practice template 7 has been completed by Homebuilders Are Us Ltd to focus attention on the waste generated throughout the project from enabling works (including demolition) to completion of construction.

Best practice TEMPLATE 7 Waste production checklist CD

Waste material	Enabling works (including demolition)		Construction works	
	Tick (✔)	Estimated quantity m^3	Tick (✔)	Estimated quantity m^3
Inert waste				
Aggregates	✔	500	✔	200
Brick/blocks	✔	300	✔	200
Ceramics	✔	200	✔	300
Concrete	✔	200	✔	100
Glass	✔	500	✔	50
Gravel	✔	100	✔	20
Sand				
Soils (uncontaminated)	✔	500		
Stone	✔	50		
Tarmac	✔	10	✔	10
Other				
Other				
Other				
Sub-total		1960		1000
Non-hazardous waste				
Canteen waste	✔	10	✔	50
Cardboard			✔	100
Metal – offcuts			✔	50

Waste material	Enabling works (including demolition)		Construction works	
	Tick (✔)	Estimated quantity m^3	Tick (✔)	Estimated quantity m^3
Non-hazardous waste (continued)				
Metal – reinforcement				
Metal – steel			✔	50
Paper			✔	50
Plasterboard			✔	500
Plastics			✔	500
Polystyrene			✔	70
Timber			✔	250
Trees	✔	300		
Vegetation (shrubs, bushes etc)	✔	200		
Other				
Other				
Other				
Sub-total		530		1050
Hazardous waste				
Asbestos	✔	200		
Bulk excavated (contaminated)				
Explosive	✔			50
Flammable				
Soils (contaminated)				
Toxic				
Other				
Other				
Other				
Sub-total		200		50
Total volumes		2690		2100

STEP 5 Guidance notes

Forecasting key waste production

Under the Site Waste Management Plans Regulations 2008,[3.1] projects with an estimated cost of greater than £300 000 must estimate the quantity of each different type of waste that will be produced, and identify the waste management action proposed. Defined waste groups should also be estimated for the stages of the project programme and the waste management options for them need to be considered for The Code for Sustainable Homes.[3.7] This must be carried out before construction work commences.

Completing the checklist (best practice template 7) should focus attention on the waste generated throughout the project from enabling works (including demolition) to completion of construction works. A best estimate of quantities should be sufficient, and should assist in prioritising the key wastes. The total volumes of wastes during enabling works (including demolition) and construction should be summarised accordingly. Tonnes can also be used. A forecast of waste quantities should also be of use when negotiating waste management packages due to the economies of scale. It may also be possible to broker waste to another site requiring material eg crushed concrete.

Once completed, this checklist can be used in the tender documentation for waste management contractors.

Waste categories

Waste generated on projects normally falls into three categories (in order of increasing environmental hazard), each containing different waste types depending on the project:

- **Inert waste** – waste that should not harm or cause adverse effects to the environment when disposed of, or does not decompose when buried. It has no potentially hazardous content once placed in landfill, eg rocks, concrete, mortar, bricks, blocks and tiles, plaster (not plasterboard), uncontaminated soils and aggregates, glass and most plastics
- **Non-hazardous waste** – waste that will break down/decompose when buried, resulting in the production of landfill gases such as methane and carbon dioxide, eg timber, paper, and cardboard, green waste, food, metal and some biodegradable plastics
- **Hazardous waste** – waste that is harmful to human health or environment, eg products liable to cause death, injury or impairment to living beings, pollution of waters or unacceptable environmental impact if improperly contained, handled, treated or disposed of. Hazardous waste includes waste with one or more of the following properties:
  - Explosive, oxidising, flammable, highly flammable, irritant, toxic, carcinogenic, corrosive, infectious, teratogenic, mutagenic, ecotoxic (see Table 10 for definitions of hazardous properties)
  - Waste which releases toxic gases in contact with water, air or acid
  - Waste which after disposal produces a leachate or other substances that possess any of the above properties
  - Harmful waste which if it is inhaled or ingested or if it penetrates the skin, may involve limited health risks.

Under The Site Waste Management Plans Regulations 2008,[3.1] as a minimum, waste types must be identified at these levels (ie inert, non-hazardous and hazardous). Under The Code for Sustainable Homes, groups of waste should be identified as outlined in the technical guidance document for The Code for Sustainable Homes.[3.7]

TABLE 10

Definitions of hazardous properties

Property	Description	COSHH warning label
Corrosive	Any waste consisting of substances and preparations which may destroy living tissue on contact. For example, products with COSHH warning labels	
Explosive	Waste consisting of substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene and represents products having the following COSHH warning label	
Flammable	Waste that consists of liquid substances and preparations having a flashpoint equal to or greater than 21°C and less than, or equal to, 55°C	
Highly flammable	Waste that consists of: ▪ Liquid substances and preparations having a flashpoint below 21°C ▪ Substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature ▪ Solid substances and preparations which may readily catch fire after brief contact with a source of ignition and which continue to burn ▪ Gaseous substances and preparations which are flammable in air at normal pressure ▪ Any substances and preparations which, in contact with water or damp air evolve highly flammable gases in dangerous quantities	
Infectious	Waste that consists of substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in humans or other living organisms	
Oxidising	Waste that consists of substances and preparations which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances	

STEP 6 Prioritising waste

Best practice template 8 has been filled in by Homebuilders Are Us Ltd to aid waste prioritisation for enabling works (including demolition) and best practice template 9 for construction works.

Best practice TEMPLATE 8 Enabling works (including demolition) CD

Waste material	Waste type	Origin of waste
Aggregates	Inert	Demolition
Bricks/blocks	Inert	Demolition
Ceramics	Inert	Demolition
Concrete	Inert	Demolition
Soils	Inert	Site strip
Tarmac	Inert	Site strip
Trees	Non-hazardous	Site strip
Vegetation	Non-hazardous	Site strip

Best practice TEMPLATE 9 Construction works CD

Waste material	Waste type	Origin of waste
Canteen	Non-hazardous	All contractors
Cardboard	Non-hazardous	Fitting out
Ceramics	Inert	Bricklayers
Concrete	Inert	Substructure and superstructure
Metal – steel	Non-hazardous	Superstructure
Plasterboard	Non-hazardous	Drylining
Polystyrene	Inert	Fitting out

STEP 6 Guidance notes

The most significant waste for enabling and construction works (by volume, weight or cost) should be listed for classification and definition of origin (include up to 10 in best practice templates 8 and 9). This will help to focus the SWMP to the site-specific issues of waste and the options for managing it. The origin of the waste should be considered with the means, tools, plant, processes, materials, procedures, training, and site layout to ensure the expected waste is minimised.

The waste champion should monitor the SWMP and disposal procedures.

STEP 7 Planning the reduction, reuse and recycling of waste

Best practice template 10 (p.112) is an example of a SWMP used by Homebuilders Are Us Ltd for planning the minimisation, reuse and recycling of waste for enabling works (including demolition) and best practice template 11 (p.113) for construction works on Project Z including the setting of targets as recommended in The Code for Sustainable Homes.[3.7]

Best practice TEMPLATE 10 Record of the reduction, reuse and recycling options of waste for enabling works (including demolition) CD

Waste material	Quantity (m^3)	Target	Trade contractor package	Waste minimisation opportunities	Onsite recycling/reuse	Offsite recycling/reuse	Disposal
Concrete	200	Recycle onsite – 90%	Demolition, piling, concrete frame, groundworks and floors	Pre-fabrication offsite, onsite batcher and plan pours (use surplus for blinding)	Excess material can be dried and reused onsite as backfill	Segregate, reprocessed and reused in construction industry	Landfill and cover
Glass	100	Recycle onsite (with hardcore) – 90%	Demolition			Segregate waste and send for recycling	Landfill
Green waste/ vegetation	500	Recycle offsite – 80%	Earthwork, demolition and landscaping	Excavate and re-plant larger specimens (trees)	Chip onsite for landscaping	Segregate, send for composting and use as mulch on land	Landfill
Hazardous waste (asbestos)			Demolition and strip out	N/A	N/A	N/A	Landfill
Hazardous waste (contaminated land)			Earthworks and groundworks	Contain in situ	Remediate onsite and reuse material	Remediate offsite	Landfill
Hazardous waste (other)							Landfill
Metal			Steel frame, temporary works, concrete frame, decking and roofing	Pre-fabrication, correct ordering, just-in-time delivery and store correctly	Reused in temporary works	Segregate waste and send to metal recycler	Landfill
Pallets			Cladding, brick and blockwork	Return pallet to supplier or use plastic pallets	Reuse pallets for internal storage and movement of materials	Send pallets for reuse	Landfill
Plasterboard			Demolition	N/A	Cannot reuse	N/A	Landfill
Rubble (hardcore)	500	Recycle onsite – 90%	Demolition, brick and blockwork	Using part of the existing structure in original form within completed construction	Use as hardcore onsite	Segregate, land reclamation, reprocessed and reused in construction industry	Landfill and cover
Soils	500	Reuse offsite – 100%	Piling, groundwork and earthworks	Store onsite	Reuse in landscaping and use as backfill	Land reclamation	Landfill and cover
Timber			Concrete frame, groundworks and joinery	Use steel shuttering and reuse all shuttering	Reuse for shuttering, temporary hoardings and general carpentry	Segregate for chipping to use in other timber construction products	Landfill
Totals	1800						

Best practice TEMPLATE 11 Record of the reduction, reuse and recycling options of waste for construction works CD

Waste material	Quantity (m^3)	Target	Trade contractor package	Waste minimisation opportunities	Onsite recycling/reuse	Offsite recycling/reuse	Disposal
Cable wiring	10	Recycle 100%				Segregated and send for recycling in order to recover high value metals	Landfill
Canteen	25	Compost 20%	Canteen and logistics	Use reusable crockery and cutlery	Compost for landscaping (must be kept separate from other waste and stored in closed top bins)	Send for composting (food waste only)	Landfill
Green waste/ vegetation			Earthwork, demolition and landscaping	Excavate and re-plant larger specimens (trees)	Chip onsite for landscaping	Segregate, send for composting and use as mulch on land	Landfill
Hazardous waste (paint tins, line markers and mastic)	50		All trades	Use solvent free paints that are not disposed of as hazardous waste and maximise use of mechanical fitting rather than adhesives	Use a lockable COSHH container for storage	Incinerator/landfill	
Hazardous waste (other)							Landfill
Insulation	50						Landfill
Metal	50	Recycle offsite – 100%	Steel frame, temporary works, concrete frame, decking and roofing	Pre-fabrication, correct ordering, just-in-time delivery and store correctly	Reused in temporary works	Segregate waste and send to metal recycler	Landfill
Mixed waste	100	Recycle 50%	All trades	Pre-assembly and fabrication offsite		Send to transfer station for further segregation	Landfill
Office	25	Recycle 50%	Site management and major packages	Print double sided, send documents electronically and non-disposable cups	Reuse paper, cartridges, plastic cups, tins and cardboard	Segregate and recycle white paper	Landfill
Packaging	150	Recycle 50%	M&E, fit-out, cladding	Ask suppliers to send product with minimal packaging, reusable containers and buy in bulk not individually wrapped products		Segregate cardboard, pallets and plastic for recycling	Landfill
Pallets	20	Reuse 100%	Cladding, brick and blockwork	Return pallet to supplier or use plastic pallets	Reuse pallets for internal storage and movement of materials	Send pallets for reuse	Landfill
Plasterboard	500	Recycle 100%	Dry lining	Procure to design specifications and store in a dry area	Keep in dedicated storage place for offcuts to reuse	Send back to plasterboard manufacturer	Landfill
Timber	300	Recycle offsite – 60%	Concrete frame, groundworks and joinery	Use steel shuttering and reuse all shuttering	Reuse for shuttering, temporary hoardings and general carpentry	Segregate for chipping to use in other timber construction products	Landfill
Totals	1170						

STEP 7 Guidance notes

Best practice templates 12, 13 and 14 (p.116) show the possible waste management options for waste materials generated onsite. To gain a credit under The Code for Sustainable Homes, at least three key waste groups should be diverted from landfill and waste should either be reused or recycled onsite, or sorted onsite and collected for recycling. If space is limited, the appointed waste management contractor should have the facility to separate and process recyclable materials offsite. The appointed waste management contractor should supply regular updates on offsite recycling rates for defined waste types.

Best practice TEMPLATE 12 Waste management options for inert waste CD

Waste material	Reduce	Reuse	Recycle/scrap	Landfill	Incinerate	Other
Aggregates	Use crushed concrete	Hardcore and fill				
Brick/blocks	Return damaged materials to supplier					
Concrete	Specify correct volume required	Hardcore and fill	Crushed for aggregate			
Glass	Examine storage and handling	Use glass as aggregate replacement in tarmac				
Gravel	Specify correct volume required		Sell to building contractor			
Rock			Sell to building contractor	Final option	Final option	
Sand	Specify correct volume required		Sell to building contractor			
Soils (uncontaminated)	Segregation during excavation	Land balancing – use as landfill cover	Sold as cover material			
Tarmac	Use glass as aggregate replacement	Planings in new tarmac				

Best practice TEMPLATE 13 Waste management options for non-hazardous waste CD

Waste material	Reduce	Reuse	Recycle/scrap	Landfill	Incinerate	Other
Canteen waste			Animal feed via compost contractor			
Cardboard	Return packaging to supplier		Collect and use compactor and bailer			
Gypsum products			Return waste to supplier			
Metals – reinforcement	Pre-cut to specification		Scrap merchant			
Metals – steel			Scrap merchant			
Metal – offcuts	Pre-cut to specification		Scrap merchant			
Paper	Double-sided print Circulate documents	Scrap notepaper	Recycle contractor			
Plasterboard	Pre-cut to specification Storage Handling		Return waste to supplier	Final options	Final options	
Plastic	Return packaging to supplier				Energy recovery	
Timber	Pre-cut to specification	Shuttering for temporary cable protection and road humps	Pallets (deposit/return) Sale of flooring and support to scrap merchant			
Trees	Incorporate into landscape design	Mulch Landscaping cover	Compost contractor			
Vegetation		Compost contractor	Compost onsite			

Best practice TEMPLATE 14 Waste management options for hazardous waste CD

Waste material	Reduce	Reuse	Recycle/scrap	Landfill	Incinerate	Other
Asbestos	Specialist contractor	Specialist contractor	Specialist contractor			
Explosive	Producer responsibility	Producer responsibility	Producer responsibility			
Flammable	Producer responsibility	Producer responsibility	Producer responsibility			
Soil (contaminated)	Segregation during excavation	Decontaminated prior to reuse	Sold as landfill cover material (depending on level)			
Topsoil (contaminated)	Segregation during excavation	Decontaminated prior to reuse	Sold as landfill cover material (depending on level)	Final options	Final options	
Toxic	Producer responsibility	Producer responsibility	Producer responsibility			

Planning for waste management onsite

Planned delivery/material take-back

Set up just-in-time delivery of materials arriving to site in order to prevent damage because of inadequate storage and weather conditions. Investigate the option of returning packaging and offcuts of materials to the manufacturers of materials. Suppliers may also have details on suitable waste management contractors that can specifically deal with waste arising from their products/materials.

Identifying waste management options with contractors

Investigate waste management options with local and national waste management contractors and investigate partnership with them. Contractors should either: segregate and recycle wastes or reuse waste. Offsite disposal to landfill or offsite incineration (combustion) should be considered as the last option. Follow the appropriate selection criteria. (Contractors should provide details of how they should reduce, reuse and recycle waste.)

Sharing services with other sites

Find out if there are other company sites nearby and find out if the waste management contract could be shared. This would also provide economies of scale for material take-back schemes.

STEP 8 Costing waste management

Homebuilders Are Us Ltd has used best practice template 15 to record the waste management costs.

Best practice TEMPLATE 15 Waste management costs CD

Waste material	Waste management contractor details	Waste management activity	Forecast total m^3 or tonnages	Unit price paid £		Cost £ (+/-)
				(price paid per m^3 or tonnes to waste management contractor)	(price gained per m^3 or tonnes for selling materials or reusing materials onsite)	
Enabling works (incl. demolition)						
Concrete	Demolition Ltd	Reuse onsite	200		2	-400
Hardcore	Demolition Ltd	Recycle onsite	500		2	-1000
Timber		Recycle onsite	0			
Soils	Groundworks Ltd	Reuse onsite	500	4		2000
					Subtotal	600
Construction works						
Hardcore	Waste Are Us Ltd	Recycle	400			-800
Hazardous waste	Waste Are Us Ltd	Landfill	50	15		750
Metals	Waste Are Us Ltd	Recycle	50		10	-500
Packaging	Waste Are Us Ltd	Recycle	150	8		1200
Plasterboard	Waste Are Us Ltd	Take-back	500		1	-500
Timber	Waste Are Us Ltd	Recycle	300	5		1500
					Subtotal	1650
					Overall total	2250

STEP 8 Guidance notes

The principal contractor should record and keep contact details of the waste management contractors, their provisions and the commercial rates for the services they provide. If the waste has a scrap value, the principal contractor could pay the construction project for the waste (recorded as a credit), or take the waste free of charge. The value of some waste should be considered during waste management package negotiations as the waste management contractors may gain a resale value for the waste.

Ideally, waste management contractors should specifically deal with the key wastes as identified during the planning stage. The waste management package should specify: return to supplier, reuse, recycle/scrap, landfill, incinerate or other (specify). The details should be provided for the entire project ie enabling works (including demolition) and construction works.

Using the waste forecasts and the waste management contractor's rates the total estimated waste costs can be calculated. The sub-totalled costs need to be provided for both enabling works (including demolition) and construction works. The subtotals can be added to provide a total forecast waste cost expressed in pounds (£).

STEP 9 Preparation checklist

Homebuilders Are Us Ltd has used best practice template 16 (p.118) to make sure that all the steps have been taken to write the best practice SWMP.

Best practice TEMPLATE 16 Preparation checklist CD

Checks (please tick)	Yes	No
1. Has administration and planning been fully completed?	✔	
2. For offsite waste management or disposal are all the waste destination details verified?	✔	
3. Have all the key wastes been forecasted and prioritised?	✔	
4. Have reuse/recycling/disposal options been identified for the waste?	✔	
5. Have terms and commercial rates been agreed with the waste management contractor(s)?	✔	
6. Have data reporting procedures been agreed with the waste management contractor(s)?	✔	
7. Has a waste segregation/collection area been prepared?	✔	
8. Has the SWMP area been adequately signposted?	✔	
9. Has the SWMP planning meeting been set?	✔	
10. Has the SWMP document control/filing system been set up?	✔	
11. Have all necessary staff and contractors read and signed the SWMP?	✔	
12. Have all the SWMP training/briefing requirements for contractor/s been met?	✔	
13. Have the waste management targets/KPIs been set?	✔	
14. Has the SWMP been approved by the project manager?	✔	
Comments/further actions		
1.		
2.		
3.		
Revisions		
Nature of revision	**Date of revision**	**Owner of revision**
Meeting with the client and demolition contractor – changed some of the waste management actions	10/07/08	Sue Jones

STEP 9 Guidance notes

Prior to implementing the SWMP, the waste champion should complete all necessary checks using the checklist (best practice template 16) to ensure the effective operation, monitoring and reporting of the SWMP.

STEP 10 Implementing the site waste management plan

The SWMP should be implemented as soon as construction work commences.

The key elements of the implementation are:

Setting up the contract

- Set minimum contract terms, commercial rates and document controls with waste management contractors
- Define disposal routes, address and contact details of waste destination
- Ensure there is a document filing system.

Site set-up

Staff should read the SWMP (as required).

- Ensure all contractors are briefed on the SWMP and training provided if the contractor requires
- Place signage around the site to ensure that waste collection points are clearly marked for contractors.

Waste Aware Construction provides signage for a nationally agreed colour coding scheme which is freely available through its website as editable PDFs. The signs are a simple and effective way to promote streaming and segregating of construction waste at source. The signs are available at www.wasteawareconstruction.com (Figure 12).

Figure 12 Colour coded signage to identify waste collection points.

Best practice TEMPLATE 17 Record of waste management information

Date removed	Waste type	Identity of waste removal company	Site the waste is being taken to and whether licensed or exempt	Waste carrier and registration number	Confirmation of delivery	Waste management route (reused on/offsite, recycled on/offsite, recovery, landfill, otherwise disposed)
11/07/08	Inert	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678123	Recycled offsite
16/07/08	Inert	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678124	Recycled offsite
18/07/08	Mixed non-hazardous	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678125	Recovery – sorted offsite by waste management contractor
01/08/08	Mixed non-hazardous	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678126	Recovery – sorted offsite by waste management contractor
15/08/08	Mixed non-hazardous	Waste Are Us Ltd	Waste Are Us Ltd transfer station	L12345	WTN number 678127	Recovery – sorted offsite by waste management contractor

Best practice template 17 shows how Homebuilders Are Us Ltd has recorded waste management information.

For projects with an estimated project cost greater than £300 000, the identity of the waste removal company removing the waste, the types of waste removed and the site the waste is being taken to must be recorded. For projects greater than £500 000, extra information must be recorded including:

- The types and quantities of waste produced
- The types and quantities of waste that have been:
  - Reused (on or offsite)
  - Recycled (on or offsite)
  - Recovered (on or offsite)
  - Landfilled
  - Otherwise disposed of.

For the mandatory element in The Code for Sustainable Homes,[3.7] confirmation is required that the waste is being monitored in terms of the amount and defined waste types. This could be via an established system eg BRE's SMARTWaste Plan (www.smartwaste.co.uk). Levels of diversion of waste for key groups should also be monitored and the actions for waste reduction reviewed for The Code for Sustainable Home credits.

Best practice template 18 is an example of how to record the above information.

Best practice TEMPLATE 18 Types and quantities (estimated in m^3 or tonnes) of waste and its management CD

Waste type	Waste material	Reuse onsite	Reuse offsite	Recycling onsite	Recycling offsite	Other form of recovery onsite	Other form of recovery offsite	Sent to landfill	Other disposal
Inert	Concrete	12	3						
	Rubble (hardcore)								
Non-hazardous	Cable and wiring								
	Glass								
	Metal						10		
	Mixed waste								
	Office/canteen								
	Packaging								
	Plasterboard								
	Timber			5					
	Other								
Hazardous	Asbestos							10	
	Contaminated land								
	Paint tins, line markers and mastic							0.05	

STEP 10 Guidance notes

Information should be obtained from the waste management contractor to record what happens to the waste once it is removed offsite. The principal contractor may also want to record the type and amount of waste that is generated onsite; this is particularly important if a waste reduction target has been set, as it has for Project Z. If the waste is recovered onsite then this also should be included in the SWMP. These templates (best practice templates 17 and 18) should be completed at least every six months. Targets set should also be monitored.

Other areas of implementation should include:

- Appropriate training for site staff
- Regular review of the SWMP through meetings etc
- Communication of the SWMP to site staff.

The SWMP should be kept onsite and be available to any trade contractor carrying out work described in it.

STEP 11 Reviewing the site waste management plan

An important part of managing a SWMP is to review how waste has been managed throughout the project. Best practice template 19 is an example of a SWMP review that could be used to record this information.

STEP 11 Guidance notes

- Compare the estimations of waste with the actual waste arisings and note down the reasons for any variance (this is a legal requirement for projects with an estimated cost of greater than £500 000) – these figures can be used for the next SWMP
- If targets have been set, calculate any deviations from the initial targets including for waste reduction and diversion of waste from landfill
- Report on the successes of any waste reduction actions
- Record any lessons learned from writing and implementing the SWMP and recommendations (best practice template 20 (p.124))
- Record any cost savings from implementing the SWMP (this is a legal requirement for projects greater than £500 000).

Best practice TEMPLATE 19 Review of the site waste management plan CD

Waste material	Estimated quantity (m^3)	Actual quantity (m^3)	Difference (+/-)	Reason for variance
Enabling works (including demolition)				
Concrete	200	250	+50	More concrete than anticipated in demolition of structure
Glass	100	100	0	
Green waste/vegetation	500	600	+100	More vegetation than expected
Hazardous waste (asbestos)	200	200	0	
Hazardous waste (contaminated land)	0		0	
Hazardous waste (other)	0		0	
Metal	0	50	+50	Metal was missing from initial forecast
Plasterboard	0	0	0	
Pallets	0	0	0	
Rubble (hardcore)	800	700	-100	Less hardcore (from bricks/blocks from demolition)
Soils	500	500	0	
Timber	0	20	+20	Timber was missing from initial forecast
Construction works				
Cable wiring	10	8	-2	More efficient use of materials
Canteen	25	25	0	
Green waste/vegetation	0	0	0	
Hazardous waste (paint tins, line markers and mastic)	50	50	0	
Hazardous waste (other)				
Insulation	50	60	+10	Rework had to be undertaken
Metal	50	40	-10	Less metal due to more efficient use of materials
Mixed waste	100	100	0	
Office	25	25	0	
Packaging	150	200	+50	More packaging generated from fit-out stages
Pallets	20	30	+10	More materials supplied on pallets than originally thought
Plasterboard	500	400	-100	Standard sizes used
Timber	250	220	-30	Less timber due to better ordering of materials

Deviations from the SWMP and cost savings:

1.	Ensure forecast of waste quantities and types is carried out in sufficient detail
2.	Look at reducing packaging from fit-out stages by talking to suppliers/trade contractors
3.	Undertake a pre-demolition audit to ensure waste from demolition is accurately quantified and appropriate actions are proposed
4.	Investigate ways of reducing the usage of pallets
5.	

References and notes for section 3

3.1 The Site Waste Management Plans Regulations 2008. Statutory Instrument 314.

3.2 Environmental Protection Act 1990 (Duty of Care) Regulations 1991.

3.3 Waste management, The Duty of Care. A code of practice (1996). London, HMSO.

3.4 WRAP. Achieving good practice waste minimisation and management. Download from www.wrap.org.uk/downloads/Mid-level_WMM_guide_lo-res_for_web.667ab11a.pdf.

3.5 Control of Pollution Act 1974.

3.6 Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC and 2003/108/EC.

3.7 The Code for Sustainable Homes. www.planningportal.gov.uk and www.breeam.org.

SECTION 4

PROCUREMENT OF CONTRACTORS: Waste management procedures for contracts

Who should read this section?

Section 4 Procurement of contractors: Waste management procedures for contracts		✔	✔	✔

Waste management contractors

The procedures included in this section are intended to be used within the procurement/contracting of waste management contractors or those responsible for waste handling or removal eg logistics companies. The procedures may also be useful for the waste champion appointed within the waste management contractor's company and for trade contractors in terms of complying with site procedures. The procedures should be discussed early in the procurement process.

This section also contains guidance on managing waste management contractors.

WRAP has produced detailed guidance including clauses for waste management which can be used for procurement of waste management contractors and trade contractors, in *Achieving good practice waste minimisation and management* available from www.wrap.org.uk/construction.

4.1 Waste management responsibilities

The waste management contractor (or equivalent) should advise on, and provide, suitable waste containers, plant, equipment and personnel to meet the requirements of the selected SWMP. The waste management contractor should employ a waste champion or equivalent to meet its obligations under the SWMP or provide suitable training.

The waste management contractor should ensure that the waste champion is competent on the basis of appropriate knowledge, training and experience eg having a certificate of technical competence (COTC). The waste management contractor should arrange for appropriate staff cover in the event of sickness, holidays, etc, to ensure a permanent presence on the site.

4.1.1 Waste management contractor responsibilities

1. Compliance with environmental legislation in relation to waste management, including compliance with the duty of care and the requirements under the Environmental Protection Act 1990[4.1] and related legislation

2. Provision of accurate records – waste transfer notes (WTNs), hazardous waste consignment notes, copies of waste carrier licences, waste management licences and exemption details
3. Monitoring and monthly reporting to the principal contractor of accurate information on the quantities of waste recycled, reused and landfilled for each material type to assess performance against agreed waste recycling targets
4. Provision, collection and delivery of suitable containers.

4.1.2 Onsite waste champion responsibilities:

1. Management of all onsite waste, in terms of segregation, storage, movement of waste around the site
2. Ensure a clean and tidy site at all times, in terms of waste
3. Manage the distribution, location and condition of waste containers around the site
4. Arrangements for the transfer of waste for treatment, recycling or disposal
5. Maintenance of accurate records (WTNs, hazardous waste consignment notes, copies of waste carrier licences, waste management licences and exemption details)
6. Compiling data relative to KPIs
7. Liaising with the principal contractor to ensure that vehicle movements and deliveries are planned
8. Arrange collection and delivery of skips
9. Propose improvements to increase recycling/reuse of waste or improve management of waste onsite
10. Attend weekly meetings with the principal contractor, agree agenda, make and distribute a record of each meetings and action points arising to an agreed template
11. Management of other personnel under their direction.

4.2 Housekeeping

The waste management contractor is responsible for periodically monitoring the general state of the site working area for waste management and safety purposes. All trade contractors should ensure that the site is left in a clean and tidy state at the end of each day. All surplus materials and waste should be transferred to the dedicated waste compound area.

Where the waste management contractor identifies waste that is unsuitably stored for either environmental or safety reasons, the condition of the area should be documented and a non-compliance notice should be issued to the responsible trade contractor to tidy the area within a given time period.

At the end of the given time period the waste management contractor should ensure that the waste has been removed and document the condition of the area again.

Where the waste has not been removed within the given time period, or where a trade contractor cannot be contacted to remove the waste within a reasonable time, or where the waste is likely to cause a health and safety or environment risk, the waste management contractor should document this photographically and arrange for the immediate removal of the waste. Any costs incurred by the waste management contractor as a result of the waste removal may be charged to the trade contractor responsible.

If, after investigations, a responsible trade contractor cannot be identified the waste management contractor will arrange for the removal of the waste and a surcharge will be made to all trade contractors working in that area in accordance with the terms and conditions of their contract. In the event of any disputes that cannot be resolved, the principal contractor should act as liaison to mediate the final outcome.

Specific control measures to be implemented on a project include:

- Burning of rubbish, waste or other materials is expressly prohibited anywhere on site
- All trade contractors are required to contribute to the clean and tidy state of the site at all times. At regular intervals, site rubbish will be removed and disposed of in the correct manner
- The principal contractor will ensure that any worksite fencing and hoardings will be maintained to comply with site conditions
- All contractors are to ensure that toilets, offices and canteen areas are kept clean and tidy at all times
- Eating, drinking and smoking will not be permitted on the site, except in designated areas to ensure that vermin are not attracted to the site – specific vermin control measures may also be required
- All vehicles leaving the site will not carry debris onto the public highway and will pass through an inspection/wheelwash point located at each site exit
- All contractors will ensure that building materials and equipment are stored and used in accordance with health and safety requirements and that chemical drums, fuels, oils and the like are stored upright, and properly sealed when not in use in designated protected storage areas
- In the event of any spillage of diesel, fuel, oil or chemicals the contractor will clean up the spillage immediately. In such an event the emergency incident procedures must be followed
- Full compliance with all legal requirements under the duty of care – Section 34 of the Environmental Protection Act 1990 (Duty of Care) Regulations 1991[4.2] and associated regulations.

4.3 Handling, collecting and disposal of waste

A designated area of the site (waste compound) should be provided for the storage of containers/skips, location of management facilities and equipment. This area will be operated and managed by the waste management contractor.

The waste management contractor should supply all skips and waste containers for the segregation and storage of waste within the central waste management compound. All containers supplied by the waste management contractor should:

- Prevent spillages or leakages
- Be corrosive resistant
- Prevent material from being blown away
- Prevent scavenging.

Other equipment may be necessary for the effective management of waste including:

- Compactors
- Baling equipment
- Lifting equipment
- Weighing equipment
- Site offices.

The waste management contractor is responsible for the correct storage and control of waste located within the waste compound to ensure environmental pollution is prevented. The waste contained within the waste compound should be segregated, as a minimum, into the following material types for reuse or recycling wherever possible:

Basic:

- Inert
- Hazardous waste
- Mixed
- Metals.

Good:

- Hardcore
- Hazardous waste
- Mixed waste
- Office paper (for site offices only)
- Packaging/cardboard
- Pallets
- Plastic
- Scrap metal and cable
- Timber.

Labelled (waste type) and colour coded signage for skips and containers should be used (in accordance with the National Colour Coding Scheme www.wasteawareconstruction.org.uk):

- Cardboard (brown)
- Hazardous (orange)
- Inert (grey)
- Mixed (black)
- Plasterboard (white)
- Plastic (brown)
- Scrap metal and cables (blue)
- Wood (green).

The plasterboard supplier should be responsible for the disposal/recycling of plasterboard. The brickwork supplier should be responsible for the disposal/recycling of brick and blockwork. This material may be crushed and added to the perimeter road.

Labelled (waste type) and colour coded signage for skips and containers should be used (in accordance with the National Colour Coding Scheme www.wasteawareconstruction.org.uk):

- Gypsum (white)
- Hazardous (orange)
- Inert (grey)
- Metal (blue)
- Mixed (black)
- Packaging (brown)
- Wood (green).

The waste management contractor should be responsible for maintaining a register of the containers which are logged out. Each container should be labelled with a number that is unique to the trade contractor. Trade contractors should be responsible for the control and management of their waste including correctly segregating waste and placing it into allocated containers. All waste should be stored within allocated containers in designated areas and away from surface water drains.

The waste champion should check the containers when they arrive at the waste compound to ensure the waste contained within is suitably segregated and the container itself remains in good condition. The waste management supervisor who is authorised to accept or refuse containers, will only accept the container if the waste is adequately segregated. If the waste is not adequately segregated, the container will not be logged back in until the trade contractor has properly segregated it or disposed of it as mixed waste. This will be agreed/checked with the principal contractor.

4.4 Hazardous waste

The management of hazardous waste is strictly controlled in the UK and more stringent rules apply to the storage and disposal of hazardous waste. Examples of hazardous waste include adhesives, asbestos, batteries, chemicals, fluorescent tubes, oil, paint and solvents.

Hazardous waste should be disposed of by arrangement with the waste management contractor. An enclosed locked drum (or skip) should be provided by the waste management contractor. Where the trade contractor wishes to make alternative arrangements for the disposal of hazardous waste, the agreement of the principal contractor is required before hazardous waste is removed from the site to ensure that it is legally disposed of. All hazardous waste disposed of by trade contractors should be accompanied by a COSHH material safety datasheet. Any trade contractor caught contaminating non-hazardous waste skips/containers with hazardous material will be contra-charged appropriately.

Potentially contaminated, stockpiled soils should be stored separately on an impermeable basis and covered where practical to prevent escape of contaminated dusts.

4.5 Reporting and documentation

The waste champion should retain (and keep up-to-date) the following information:

- WTNs and hazardous waste consignment notes
- Copies of the carrier's licence for all carriers used
- Copies of the waste management licences (or exemptions) for all destinations of waste
- A register of containers logged to each trade contractor
- Quantities (weight and/or volume) of waste produced

The waste champion should supply the following information on a monthly basis:

- The quantity (weight and/or volume) of waste produced for each waste type together with the destination of the waste (reused, recycled, landfilled etc.) for each trade contractor and for the site as a whole
- Details of abandoned or damaged waste containers
- Recommendations for improved waste management/minimisation.

Trade contractors

The procedures in this section can be included in a SWMP by the principal contractor and may be helpful in selecting trade contractors. They can be used for procuring trade contractors who are responsible for their own waste or have their waste managed through the principal contractor. The procedures should be discussed early in the procurement process.

WRAP has produced detailed guidance including clauses for waste management which can be used for procurement of waste management contractors and trade contractors, in *Achieving good practice waste minimisation and management* available from www.wrap.org.uk/construction.

This section also contains guidance on managing trade contractors once the project has commenced.

4.6 Maximising the recovery of materials

The aim of including procedures for working with trade contractors in the SWMP is to ensure that the volume of waste generated is kept to a minimum, and that opportunities to recover materials are maximised. This covers three areas:

Waste reduction – avoiding the creation of waste by reducing the quantity of waste before it comes onto the site and avoiding the production of unnecessary waste onsite

Waste reuse – reusing a product more than once either for the same or different purpose without additional reprocessing for both the construction and demolition phases (reuse onsite is preferable)

Waste recycling – diverting waste from landfill by segregating on/offsite by recycling.

4.7 Waste reduction

All trade contractors should identify how they propose to minimise waste production onsite prior to work commencing. Trade contractors should actively seek opportunities for reducing waste at source. Examples of waste reduction include:

- Steel banding instead of shrinkwrapping eg bricks, light steel bundles
- Eliminating both cardboard boxes and shrinkwrapping on the same package
- Shredded paper filler instead of polystyrene chips
- Timber separators rather than plasterboard strips
- Providing materials to the correct size to reduce offcut waste
- Offsite fabrication
- Supplying goods in appropriate quantities, reducing the amount of 'extra' material and deliveries
- Corner and edge protective packaging for furniture items
- Just-in-time delivery
- Appropriate onsite storage of materials to minimise the risk of damage.

4.8 Waste reuse

4.8.1 Demolition

A pre-demolition audit eg the ICE Demolition Protocol[4.3] should be carried out to ensure accurate forecasting for types, amounts and recovery routes for demolition waste. High value demolition material will be salvaged and sold/reused. Suitable demolition material onsite should be reused for temporary hard standings and roadways. Sorted demolition material should be used as hardcore for permanent works. Other demolition waste should be segregated for recycling.

4.8.2 Construction

During construction, an area will be created to allow material to be reused.

Examples of waste reuse include:

- Pallets
- Use of timber offcuts as noggins
- Onsite aggregates
- Take-back of materials for reuse eg cable drums
- High value salvage material eg slate roof tiles and wood flooring.

4.9 Waste recycling

For this project a target to recycle (X%) of materials generated during the construction process has been set within the SWMP. This target will be achieved by onsite segregation of suitable materials and further offsite segregation of materials at the waste management contractor's facilities. Examples of recycling include:

- Shredding timber for chipboard manufacture
- Take-back of plasterboard for plasterboard recycling (into new plasterboard)
- Use of recycled concrete aggregate into new concrete.

Each trade contractor working on the project will be expected to apply this to their operations. Trade contractors should define how they propose to manage waste produced onsite and complete a SWMP. See Template 2 in Section 1 as an example of a completed SWMP template.

Information from each trade contractor will be required to provide:

- The name and contact details of the nominated individual responsible and in charge of waste management onsite

- Identification of the major waste streams likely to be created during the project programme
- Estimate of the quantity of arisings (in volume/tonnes) produced at each stage of the work package
- How waste will be reduced and managed onsite.

4.10 Waste management responsibilities

Responsibility for waste management and the removal of waste from the site varies depending on the nature of the activities being conducted. An example of a summary of waste management responsibilities is shown in Table 11.

TABLE 11

Waste management responsibilities

	Site activity	Price waste streams	Waste management responsibility
Type A trade contractor	Brick and blockwork	Bricks (crushed and incorporated into works)	
	Demolition and site clearance	Hardcore, spoil and timber	Trade contractor has full responsibility for its own waste management
	Drylining	Plasterboard (waste to be removed by trade supplier)	
	Foundations/piling	Spoil and hardcore	
	Groundworks	Spoil	
	Structure	Bulk concrete, miscellaneous hardcore and metal	
Type B trade contractor	Building envelope	Timber, plastic, cardboard, hardcore/rubble, metal and hazardous waste	Waste management contractor has responsibility for overall waste management and removal of waste from site Individual trade contractors are responsible for segregation and distribution of waste onsite and at the waste compound
	Catering facilities	Food waste and packaging	
	Landscaping and habitat restoration/creation	Topsoil and vegetation	
	Mechanical and electrical (M&E)	Cables, metal, timber, plastic, cardboard, plastic packaging and hazardous waste	
	Office activities	Paper, cardboard, plastic packaging and general office waste	
	Site re-instatement, removal of site offices and final clear away	Timber, hardcore, metal and office waste	
	Trades (joinery, painting, plastering, etc.)	Timber, cardboard, plastic packaging and hazardous waste	

Type A trade contractors

Type A trade contractors are responsible for the removal and management of their own waste and will collect, store, segregate and dispose of all waste materials in accordance with industry best practice and current legislation. They should provide relevant copies of documentation for all waste carriers and disposal sites on a monthly basis and ensure these are up-to-date. This includes:

- Waste carrier licences
- Waste management licences
- Waste exemption certificates
- Waste transfer notes (WTNs).
- Hazardous waste consignment notes.

Trade contractors should ensure that all documentation (WTNs, consignment notes etc) are correctly completed and retained on file for the appropriate period (ie two years for WTNs and three years for consignment notes for hazardous waste).

Type A trade contractors are responsible for providing the principal contractor with a monthly breakdown of:

- Type of waste materials
- Total quantity of waste material types by volume (m^3) and/or weight (tonnes)
- The percentage of each waste material type that is reused, recycled or sent to landfill.

Trade Contractor Template 1 is an example of a template that could be used to collect data on waste management.

Trade contractor TEMPLATE 1 Type A trade contractor: waste management data CD

Project name:	
Trade contractor name:	Work package:

Waste	Volume (m^3) or tonnes (please specify)	Percentage of the total waste disposed of (%)
General waste sent to landfill (please detail material types)		
Material reused/recycled		
Hardcore		
Metal		
Plasterboard		
Wood		
Other (detail type)		
Total volume of waste generated in one month		
Percentage of waste recovered in one month		

Type B trade contractors

Type B trade contractors are not responsible for overall waste management and removal of waste from site; the principal contractor will appoint a waste management contractor to fulfil this function.

4.11 Housekeeping

Specific control measures should be implemented.

- Burning of rubbish, waste or other materials is expressly prohibited anywhere onsite
- All contractors will contribute to the clean and tidy state of the site at all times. At regular intervals, site waste will be removed and disposed of in the correct manner
- The trade contractor will ensure that any site fencing and hoardings will be maintained to comply with site conditions

- All trade contractors will ensure that toilets, offices and canteen areas are kept clean and tidy at all times
- Eating, drinking and smoking will not be permitted onsite, except in designated areas to ensure that vermin are not attracted to the site – specific vermin control measures may also be required
- All vehicles leaving the site will not carry debris on to the public highway and will pass through an inspection/wheelwash point located at each site exit
- All trade contractors will ensure that building materials and equipment are stored and used in accordance with health and safety requirements and that chemical drums, fuels, oils etc are stored upright and properly sealed when not in use in designated protected storage areas
- In the event of any spillage of diesel, fuel, oil or chemicals the trade contractor will clean-up the spillage immediately. In such an event, the emergency incident procedures must be followed
- Full compliance with all legal requirements under Section 34 of Environmental Protection Act 1990 (Duty of Care) Regulations 1991[4.2] and associated Regulations.

4.12 Handling, collecting and disposal of waste

Trade contractors are responsible for the control and management of their own waste, including correctly segregating waste and placing it into allocated containers. Appropriate containers should be positioned at the point of waste creation (eg next to the place of work) or at a location designated by the principal contractor. All waste should be stored within allocated containers in designated areas and away from surface water drains.

Trade contractors should pay particular care to the segregation and correct, safe storage of hazardous waste.

A central waste compound area should be located at a designated area within the site of the project. Trade contractors should remove the filled waste containers to the designated waste compound area. The compound area should have a concrete base and contain colour coded skips. All containers supplied by the waste management contractor should:

- Prevent spillages or leakages
- Be corrosive resistant
- Prevent material from being blown away
- Prevent scavenging.

Other equipment may be necessary for the effective management of waste including:

- Compactors
- Baling equipment
- Lifting equipment
- Weighing equipment
- Site offices.

Equipment should be stored in the waste compound area and maintained by the waste management contractor. The waste management contractor is responsible for the correct storage and control of waste located within the waste compound to prevent environmental pollution.

The waste management contractor is responsible for maintaining a list of which containers are logged out to each trade contractor. Each container should be labelled with a number that is unique to a specified trade contractor. Trade contractors are responsible for the care of containers logged out to them and will be held liable for any

damage to the container. Trade contractors are responsible for collecting empty containers from the designated waste collection point and returning their filled containers.

The waste champion should check the containers when they arrive at the waste compound to ensure the waste contained is suitably segregated and the container itself remains in good condition. The container will be accepted if the waste is adequately segregated. If the waste is not adequately segregated, the waste management supervisor will refuse to accept the container and will not log the container back in until the trade contractor has properly segregated it or dispose of it as mixed waste. This should be agreed/checked with the principal contractor.

Waste should either be segregated at a basic or good level for recycling:

Basic:

- Inert
- Mixed
- Metals
- Hazardous waste.

Good:

- Timber
- Pallets
- Plastic
- Packaging/cardboard
- Office paper (for site offices only)
- Hardcore
- Scrap metal and cable
- Mixed waste
- Hazardous waste.

Labelled (waste type) and colour coded signage for skips and containers should be used (in accordance with the National Colour Coding Scheme www.wasteawareconstruction.org.uk):

- Scrap metal and cables (blue)
- Wood (green)
- Plasterboard (white)
- Plastic (brown)
- Cardboard (brown)
- Mixed (black)
- Hazardous (orange)
- Inert (grey).

The plasterboard supplier should be responsible for the disposal/recycling of plasterboard. The brickwork supplier should be responsible for the disposal/recycling of brick and blockwork. This material may be crushed and added to the perimeter road.

Where onsite segregation of waste is not practical (ie lack of space), then the principal contractor or nominated trade contractor should investigate opportunities with the waste management contractor for offsite recovery.

4.12.1 Hazardous waste

The management of hazardous waste is strictly controlled in the UK and more stringent rules apply to the storage and disposal of hazardous waste. Examples of hazardous waste include oil, paint, adhesives, solvents, batteries, asbestos, fluorescent tubes and chemicals.

Hazardous waste should be disposed of by arrangement with the waste management contractor. An enclosed locked drum (or skip) should be provided. Where the trade contractor wishes to make alternative arrangements for the disposal of hazardous waste, the agreement of the principal contractor is required before hazardous waste is removed from the site to ensure that it is legally disposed of. All hazardous waste disposed of by trade contractors should be accompanied by a COSHH material safety datasheet. Any trade contractor caught contaminating non-hazardous waste skips/containers with hazardous material will be contra-charged appropriately.

Potentially contaminated stockpiled soils should be stored separately on an impermeable basis and covered where practical to prevent escape of contaminated dusts.

4.12.2 Liquid waste

All waste fuel oils, diesels, concrete washout and wastewaters should not be allowed to discharge down surface drains. Where plant maintenance is carried out onsite, used oil should be stored in a bunded area for collection. Oil and fuel filters should also be stored in a designated bin in a bunded area for separate collection and recycling. Used oil and filters are designated as hazardous waste.

4.12.3 Clinical waste

All clinical waste (plasters, bandages, blood soaked bandages and feminine hygiene waste) should be disposed of in a clinical waste bin. This waste should not be disposed of in any other container.

4.13 Monitoring the site

The waste management contractor is responsible for periodically monitoring the general state of the site working area for waste management and safety purposes.

Where the waste management contractor identifies waste that is unsuitably stored for either environmental or safety reasons, the waste management contractor should document the area and issue a non-compliance notice to the responsible trade contractor to tidy the area within a given time period. This will be followed up by the waste management contractor at the expiry of the time period to ensure the waste has been removed and to document the condition of the area. Where the waste has not been removed within the given time period, or where a trade contractor cannot be contacted to remove the waste within a reasonable time, or where the waste is likely to cause a health and safety or environmental risk, the waste management contractor should take pictorial documentation and arrange for the immediate removal of the waste. Any costs incurred by the waste management contractor as a result of the waste removal will be charged to the trade contractor responsible. If, after investigations, a responsible trade contractor cannot be identified the waste management contractor will arrange for the removal of the waste and a surcharge will be made to all trade contractors working in that area in accordance with the terms and conditions of the contract. In the event of any disputes that cannot be resolved, the principal contractor will act as liaison to mediate the final outcome. The decision of the principal contractor in any dispute resolution will be final and will not be open to any appeal.

4.14 Training

All trade contractors will be expected to undertake at least one toolbox talk per month on relevant environmental issues related to their work including waste management.

References and notes for section 4

4.1 The Environmental Protection Act 1990.

4.2 Environmental Protection Act 1990 (Duty of Care) Regulations 1991.

4.3 www.aggregain.org.uk/demolition/the_ice_demolition_protocol/index.html.

SECTION 5

APPENDIX
Checklists of responsibilities by job role

The checklists in this section will help the writing and implementation of a SWMP. Each checklist is structured around four different job roles appropriate to their level of involvement in the SWMP. The job roles are:

- Operative
- Waste champion
- Trade contractor
- Site manager/project manager.

The checklists can be used as part of a routine environmental audit, within a training programme, or as an independent tool for implementing the SWMP.

Who should read this section?

Section 5 Appendix Checklists of responsibilities by job role	✔	✔	✔	✔

CHECKLIST 1 Operative CD

	Y/N	Comments
Onsite issues		
Has appropriate training been given to you on: ▪ The SWMP ▪ Waste procedures onsite (including any segregation) ▪ Materials' storage ▪ Hazardous waste		
Are you aware of your responsibilities under the Duty of Care requirements?		
Are there different containers/skips in place for you to separate your waste? For example: ▪ Metals ▪ Inert ▪ Wood		
Are these containers/skips easy to access?		
Do you have a place to store your materials safely?		
Are your materials and tools in good working order?		
Is the site free of potential accidents? For example: ▪ Loose cables ▪ Lack of signs ▪ Untidy and messy		
Do you have a good working relationship with your site/project manager? For example: ▪ Communication ▪ Encouraging ideas		
Do you know your role within the SWMP?		
Do you know where the SWMP document is located?		
Do you know who the waste champion is onsite?		

CHECKLIST 2 Waste champion CD

	Y/N	Comments
Onsite issues		
Have you been given adequate training to be a waste champion?		
Do you have adequate resources to carry out your role?		
Are you aware of your role within the SWMP?		
Are you reporting back issues relating to the SWMP?		
Are the waste procedures working well eg segregation?		
Are you responsible for monitoring any of the waste procedures?		
Are you checking that the Duty of Care requirements are being met eg waste transfer notes and waste carriers licences?		
Are you measuring waste onsite?		
Have you identified any materials that can be reused onsite?		
Do you know what happens to the waste once it leaves the site?		
Is there appropriate training in place for the SWMP?		
Are there any suggestion schemes in place?		
Is your feedback on waste regularly communicated to the project team?		

CHECKLIST 3 Trade contractor CD

	Y/N	Comments
Planning issues		
Do you have your own waste management policy?		
Have you been asked to predict how much waste you will produce and what will happen to it?		
Has the SWMP been communicated to you in your pre-project meeting?		
Are you fully aware of the contractual obligations and financial systems for onsite waste management?		
Do you have to meet any waste targets?		
Have you looked at ways of minimising waste eg by ordering less materials?		
Has reusable packaging and/or take-back been considered/set-up with the main material suppliers?		
Onsite issues		
Do you know the site regulations for waste?		
Is your waste stored and secured adequately onsite?		
Is there room for segregation for your waste? If yes: ▪ Is it easy to access? ▪ Are the containers/skips clearly labelled?		
If you are responsible for your waste, have you checked that you are using licensed carriers and facilities?		
Do you have appropriate storage for your materials?		
Have personnel received training?		
Do you have a nominated person for managing waste in your team?		
Are you encouraged to give feedback on issues related to the SWMP?		
Is your waste data being fed back into the SWMP?		
Do you know your role/the project team's role within the SWMP?		
Do you/the project team know where the SWMP is located?		
Do you know who the waste champion is onsite?		

CHECKLIST 4 Site manager/project manager CD

	Y/N	Comments
Planning issues		
Has your company adopted a waste management policy?		
Have you identified who is responsible for implementing the SWMP?		
Have trade contractors producing significant waste streams been identified and included into the SWMP?		
Have you appointed a waste champion?		
Does the waste champion have the appropriate knowledge, training, resources and authority?		
Have you given an appropriate overview of the SWMP to the waste champion and others?		
Have you set appropriate targets?		
Have you discussed waste management requirements with your waste management contractor?		
Has the project team (eg client, designer) had involvement in planning the SWMP?		
Have you got a designated storage area for materials delivered to site?		
Has an area of the site been designated for waste management, including segregation of waste?		
Have measures been put in place to deal with expected and unexpected hazardous waste?		
Where relevant, have appropriate licences been obtained for waste management?		
Have opportunities been considered for reuse of materials onsite?		
Has full consideration been given to the use of reclaimed and recycled materials during site set-up and construction?		
Can unused materials be returned to the main material suppliers or used on other jobs in case of over-ordering?		
Is reusable packaging and/or take-back been considered/set-up with the main material suppliers?		

CHECKLIST 4 Site manager/project manager (continued) CD

	Y/N	Comments
Onsite issues		
Is the site well organised to meet the company's expectations?		
Have all job descriptions and responsibilities for waste management been agreed?		
Have toolbox talks been planned for all site staff about waste management onsite?		
Have you clearly labelled containers/skips to avoid confusion?		
Have you ensured the safe and secure handling and transportation of your waste?		
Have you ensured that you are compliant with the Duty of Care requirements? ▪ Checking waste transfer notes ▪ Checking authorisation of registered carriers ▪ Registered exempt sites ▪ Licensed waste management facilities		
Are reports regularly produced regarding waste quantities and routes?		
Is the SWMP being communicated around the site?		
Is the SWMP regularly reviewed?		
Are barriers to good waste management practice considered and noted?		
Post-completion issues		
Has a final report on waste quantities (estimates versus actuals), waste reduction, segregation, recovery and disposal (with costs and savings identified) been completed?		

REFERENCES

Section 1 Background and general guidance

1.1 The Site Waste Management Plans Regulations 2008. Statutory instruments 314.

1.2 www.defra.gov.uk/environment/waste/strategy/strategy07/index.htm.

1.3 The Code for Sustainable Homes. www.planningportal.gov.uk and www.breeam.org.

1.4 Waste Framework Directive (European Directive 2006/12/EC).

1.5 The Environmental Protection Act 1990.

1.6 The 1975 Waste Framework Directive.

1.7 Waste management, The Duty of Care. A code of practice (1996). London, HMSO.

1.8 Environmental Protection Act 1990 (Duty of Care) Regulations 1991.

1.9 DTI (2004). Site waste management plans: Guidance for construction clients and contractors.

1.10 www.smartwaste.co.uk.

1.11 Saving money and raw materials by reducing waste in construction: case studies (GG493). www.envirowise.gov.uk.

1.12 www.aggregain.org.uk/demolition/the_ice_demolition_protocol/index.html.

1.13 www.wrap.org.uk.

1.14 www.bre.co.uk/greenguide/page.jsp?sid=435.

1.15 www.greenspec.co.uk.

1.16 Saving money and raw materials by reducing waste in construction: case studies from Scotland (GG500). www.envirowise.gov.uk.

1.17 BRE (2000). The green guide to specification for housing. Garston, Watford, IHS BRE Press.

1.18 www.opsi.gov.uk/SI/si2005/20050895.htm.

1.19 www.opsi.gov.uk/legislation/wales/wsi2005/20051820e.htm.

1.20 www.englishpartnerships.co.uk/allertonbywater.htm.

Section 2 Procurement guidance

2.1 WRAP. Achieving good practice waste minimisation and management. Download from www.wrap.org.uk/downloads/Mid-level_WMM_guide_lo-res_for_web.667ab11a.pdf.

2.2 Environmental Protection Act 1990 (Duty of Care) Regulations 1991.

Section 3 Waste management practice: Guidance and templates

3.1 The Site Waste Management Plans Regulations 2008. Statutory Instrument 314.

3.2 Environmental Protection Act 1990 (Duty of Care) Regulations 1991.

3.3 Waste management, The Duty of Care. A code of practice (1996). London, HMSO.

3.4 WRAP. Achieving good practice waste minimisation and management. Download from www.wrap.org.uk/downloads/Mid-level_WMM_guide_lo-res_for_web.667ab11a.pdf.

3.5 Control of Pollution Act 1974.

3.6 Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC and 2003/108/EC.

3.7 The Code for Sustainable Homes. www.planningportal.gov.uk and www.breeam.org.

Section 4 Procurement of contractors: waste management procedures for contracts

4.1 The Environmental Protection Act 1990.

4.2 Environmental Protection Act 1990 (Duty of Care) Regulations 1991.

4.3 www.aggregain.org.uk/demolition/the_ice_demolition_protocol/index.html.

CD-ROM CONTENTS

The CD-Rom contains all of the templates and checklists included in the guide. The templates are supplied in two formats: as Excel files and as PDFs. You can customise the Excel files by adding your own data in the Excel spreadsheets. The PDFs cannot be modified but can be printed out and completed by hand.

The CD-Rom also contains a copy of NF8 in PDF format.

Section 1 – Background and general guidance

Template 1	Estimated waste arisings
Template 2	Planning for site waste management
Template 3	Storing raw materials delivered to the site

Section 3 – Waste management practice

Part 1: Standard practice templates

Standard practice template 1	Project information
Standard practice template 2	Register of waste carrier licences and permits
Standard practice template 3	Waste production checklist
Standard practice template 4	Enabling works (including demolition)
Standard practice template 5	Construction works
Standard practice template 6	Record of the reuse, recycling and disposal options of waste for enabling works (including demolition)
Standard practice template 7	Record of the reuse, recycling and disposal options of waste for construction works
Standard practice template 8	Waste management options for inert waste
Standard practice template 9	Waste management options for non-hazardous waste
Standard practice template 10	Waste management options for hazardous waste
Standard practice template 11	Preparation checklist
Standard practice template 12	Record of waste management information
Standard practice template 13	Types and quantities of waste (estimated in m^3 or tonnes) and its management
Standard practice template 14	Review of waste information

Part 2: Good practice templates

Good practice template 1	Project information
Good practice template 2	Waste management project administration
Good practice template 3	Record of waste management planning meetings
Good practice template 4	Responsibility for waste management
Good practice template 5	Register of waste carrier licences and permits
Good practice template 6	Waste production checklist
Good practice template 7	Enabling works (including demolition)
Good practice template 8	Construction works
Good practice template 9	Record of the reduction, reuse and recycling options of waste for enabling works (including demolition)
Good practice template 10	Record of the reduction, reuse, recycling options and disposal of waste for construction works
Good practice template 11	Waste management options for inert waste

Good practice template 12	Waste management options for non-hazardous waste
Good practice template 13	Waste management options for hazardous waste
Good practice template 14	Waste management costs
Good practice template 15	Preparation checklist
Good practice template 16	Record of waste management information
Good practice template 17	Types and quantities of waste (estimated in m^3 or tonnes) of waste and its management
Good practice template 18	Review of waste information
Good practice template 19	Lessons learned

Part 3: Best practice templates

Best practice template 1	Project information
Best practice template 2	Waste management project administration
Best practice template 3	Record of waste management planning meetings
Best practice template 4	Waste reduction
Best practice template 5	Responsibility for waste management
Best practice template 6	Register of waste carrier licences and permits
Best practice template 7	Waste production checklist
Best practice template 8	Enabling works (including demolition)
Best practice template 9	Construction works
Best practice template 10	Record of the reduction, reuse and recycling options of waste for enabling works (including demolition)
Best practice template 11	Record of the reduction, reuse and recycling options of waste for construction works
Best practice template 12	Waste management options for inert waste
Best practice template 13	Waste management options for non-hazardous waste
Best practice template 14	Waste management options for hazardous waste
Best practice template 15	Waste management costs
Best practice template 16	Preparation checklist
Best practice template 17	Record of waste management information
Best practice template 18	Types and quantities of waste (estimated in m^3 or tonnes) and its management
Best practice template 19	Review of the site waste management plan
Best practice template 20	Lessons learned

Section 4 – Procurement of contractors

Trade contractor

Trade contractor template 1	Type A trade contractor: waste management data

Section 5 – Appendix

Checklists of responsibilities by job role

Checklist 1	Operative
Checklist 2	Waste champion
Checklist 3	Trade contractor
Checklist 4	Site manager/project manager

NHBC Foundation publications

A guide to modern methods of construction
NF1, December 2006

Conserving energy and water, and minimising waste
A review of drivers and impacts on house building
NF2, March 2007

Climate change and innovation in house building
Designing out risk
NF3, August 2007

Risks in domestic basement construction
NF4, October 2007

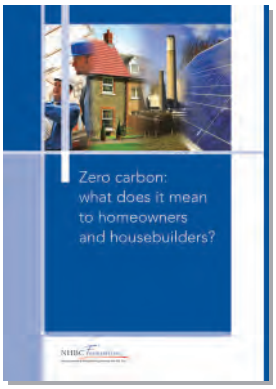
Ground source heat pump systems
Benefits, drivers and barriers in residential developments
NF5, October 2007

Modern Housing
Households' views of their new homes
NF6, November 2007

A review of microgeneration and renewable energy technologies

The use of microgeneration and renewable energy technologies has been highlighted as one key approach in addressing the government's ambitious 2016 zero carbon homes target. With less than a decade within which to develop systems and processes to meet this target, and with strict definitions of zero carbon outlined in the Code for Sustainable Homes, the work needed cannot be underestimated. This review is, therefore, both timely and pertinent, assessing a variety of the current technologies for their likely capability, impact, payback periods and suitability for use in the domestic sector. In addition it reviews the legislative framework and the mechanisms local authorities are implementing to drive the uptake of these technologies.

NF7, January 2008



Zero carbon: what does it mean to homeowners and housebuilders?

The largest body of work carried out by the Foundation since it began involved more than 600 interviews, both individually and in focus groups, in a market research survey of consumer and builder attitudes and understanding of zero carbon. The consumer research focused on ascertaining attitudes towards zero carbon issues and identifying levels of understanding along with thoughts and feelings on the potential impact zero carbon homes may have on lifestyles. The builder research portrays the views of the industry on the need for housebuilders to have confidence in the implementation of technologies and strategies for carbon reduction, their views on The Code for Sustainable Homes and how they believe their customers will react to new construction methods and technologies.

NF9, April 2008

NHBC Foundation publications in preparation

- Learning the lessons from systemic building failures
- Hydraulic lime mortars

NHBC FOUNDATION
Housing research & development in partnership with BRE Trust
www.nhbcfoundation.org

Site waste management

Guidance and templates for effective site waste management plans

Implementing a site waste management plan is now a requirement under The Site Waste Management Plans Regulations 2008, and is also a key element of The Code for Sustainable Homes.

NHBC Foundation, in partnership with WRAP, has produced this comprehensive guide to help the housebuilding and construction industry to write and implement site waste management plans and to take advantage of the benefits of putting these plans into practice through more efficient sites and reduced waste. By following the guide, all parties – clients, designers, principal contractors, waste management contractors and trade contractors – understand their role and responsibilities for effective waste management at all stages of the contract.

As well as providing detailed background information and procurement guidance, the guide explains the three levels of site waste management practice that are relevant for different types of contract: standard, good and best practice.

To enhance the value of the guide all the templates for standard, good and best practice, and checklists of job roles, are included on a CD-Rom as PDFs and Excel files, which can be used in a site waste management plan. A PDF of the whole guide is also included.

NHBC Foundation
Housing research & development in partnership with BRE Trust

The NHBC Foundation has been established by NHBC in partnership with the BRE Trust. It facilitates research and development, technology and knowledge sharing, and the capture of industry best practice. The NHBC Foundation promotes best practice to help builders, developers and the industry as it responds to the country's wider housing needs. The NHBC Foundation carries out practical, high quality research where it is needed most, particularly in areas such as building standards and processes. It also supports house builders in developing strong relationships with their customers.

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