

Guidance document - DRAFT
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Guidelines for measuring and reporting construction waste

This document provides guidance on how to measure, and where required report, waste arisings and recycling/recovery from construction, demolition and excavation activities on projects in Europe

Introduction

European Directive 2008/98/EC states that *"In order to comply with the objectives of this Directive, and move towards a European recycling society with a high level of resource efficiency, Member States shall take the necessary measures designed to achieve the following targets:*
(b) by 2020, the preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in European Waste Catalogue shall be increased to a minimum of 70 %"

European Governments each have policies and agendas that focus on reducing waste to landfill and/or incineration without energy recovery. For example the Strategy for Sustainable Construction (2008)¹ in England has a specific target for the construction sector, defined as: *"By 2012, a 50% reduction in construction, demolition and excavation waste to landfill compared to 2008"*.

Also the Spanish Plan of Construction and Demolition Wastes (*Plan Nacional de Residuos de Construcción y Demolición*) has set the following targets:

- 15% reduction or reuse of C&D wastes, by 2011
- 40% recycling of C&D wastes, from 2011
- 70% recovery of empty packaging C&D wastes, from 2010

In conjunction with the United Kingdom Contractors Group (UKCG) and Civil Engineering Contractors Association (CECA), the delivery body for UK waste strategies, the Waste & Resources Action Programme (WRAP)², have established the following Key Performance Indicators (KPIs) in order to benchmark the performance of the UK construction industry against waste to landfill targets:

- Waste arisings: tonnes of waste generated per £100k of construction output (t/£100k)
- Waste to landfill: tonnes of waste disposed of to landfill per £100k of construction output (t/£100k)
- Waste diversion rate: percentage of waste diverted from landfill (%)

It is proposed that ENCORD members adopt a similar protocol, and KPIs. This document sets out the principles and a clear method for the collection, and if required the reporting of construction, demolition and excavation (CD&E) waste data, and covers:

- 1.0 Scope of waste measurement and reporting
- 2.0 Waste destinations and default diversion rates
- 3.0 Units of measurement
- 4.0 The Waste Reporting Portal

Any words or phrases **highlighted as indicated** are explained in more detail in the glossary at the back of the document.

¹ <http://www.bis.gov.uk/files/file52843.pdf>

² <http://www.wrap.org.uk/construction>

1.0 Scope of waste measurement and reporting

The following points outline the scope of waste measurement and the reporting requirements. It is recommended that all construction clients and contractors adopt these principles in order to improve consistency and transparency in the industry.

1. **Only materials taken off site as a waste are considered a waste.** Different **diversion rates** are then applied to calculate the amount of waste sent to landfill/incineration without energy recovery, depending on the type and condition of the material, and the destination to which it is sent (see Section 2.0 for further detail).
2. Organisations should record (as a minimum):
 - i) Total tonnes (or bulk m³) of waste arisings for all³ **construction works** undertaken
 - ii) Total tonnes (or bulk m³) of waste sent to landfill/incineration without energy recovery for all construction works undertaken
 - iii) Total **construction cost** of all construction works undertaken

ENCORD members will need to identify waste from construction, demolition and excavation activities separately for parts 2.i) and 1.ii).

3. Organisations should report on an annual basis as a minimum
4. It is also optional to record data for materials that are reused on site. These data should not be reported in the waste arisings figures.
5. It is optional to record data for materials that are recovered on site and leave the site as a product, whether these are either; **reused** in their original form, or **remediated**, processed or **recycled** on site, and then sent off site for reuse. This data should not be to be reported in the waste arisings figures.
6. Trade effluent (disposed of via tankers, foul sewers, surface and water drains, water courses, etc.) is not permitted to be disposed of to landfill, and therefore should not be included in the gross waste calculations.
7. All subcontractor wastes (including demolition waste) that are part of the main contract of works should be reported where disposed of via the site. Companies should also include wastes from site preliminaries within skips managed by the site waste management contractor/carrier (i.e. waste resulting from the site office and temporary site infrastructure). It is optional to report company waste that does not result from a construction site (e.g. Central Office waste), and this is to be reported separately.
8. For the purpose of reporting construction waste from joint venture (JV) projects; waste and proportionate construction value of projects should be allocated to each main contractor relative to the percentage equity invested within the JV vehicle.
 - i) The responsibility for monitoring waste data from a JV project should be allocated at the start of the JV. Waste data should be collated quarterly and proportioned to each contractor.
 - ii) Where waste data is not provided by one or more parties to the JV, then all data from the project should be discounted, and the value omitted from any data reported.

Organisations can choose the level of detail in which they report; further explanation is provided in Section 4.0 Waste to Landfill Reporting Portal.

³ Data should be available for all **projects** with a value of €300,000 or more (excluding VAT) as this aligns with the threshold for the legal requirement for a site waste management plan in England. If data is available for projects of a lower value this should also be reported.

2.0 Waste destinations and default waste diversion rates

Waste materials may be sent to a number of off site destinations. For the purposes of reporting, one of the destination types in Table 1 below should be selected.

Where reliable data (that can be verified by Government Agency or other approved third party verification) is available on the actual diversion rate achieved for waste sent to a specific destination, the default diversion rates shown below can be overwritten. An individual contractor may wish to audit transfer stations and waste management companies used in order to validate data received.

Organisations should specify that this information is required when procuring waste management services. If this information is not available, the quantity of waste being recovered via each destination will be calculated using the default diversion rates shown below.

Table 1 Waste destinations and default diversion rates for waste sent off site

Destination	Diversion rate
<p>Mixed waste sent off site for recycling or recovery Waste deposited in mixed containers on site and sent to a dedicated Recycling Centre, Materials Recovery Facility or Waste Transfer Station for recycling off site, or sent for incineration at an energy recovery facility⁴.</p>	50%
<p>Segregated waste sent off site for recycling or recovery Wastes that are placed into segregated containers on site and sent to a dedicated Recycling Centre, Materials Recovery Facility or Waste Transfer Station for recycling off site, or sent for incineration at an energy recovery facility⁵.</p>	80%
<p>Landfill (inert materials for beneficial reuse) A proportion of inert soil and stones (17 05 04) and brick, concrete, tiles and ceramics (17 01 01, 17 01 02, 17 01 03, and 17 01 07) sent to landfill will go to beneficial reuse (e.g. landfill engineering and restoration)⁶.</p>	50%
<p>Waste Framework Directive Exemptions for beneficial reuse Segregated C,D&E sent to a site operating under an exemption for reuse or recycling.</p> <ul style="list-style-type: none"> Waste consisting of soil & stones (17 05 04) and brick, concrete, tiles and ceramics (17 01 01, 17 01 02, 17 01 03, and 17 01 07), going for use in construction or for the improvement of land under exemptions is classified as beneficial reuse. Other segregated waste, consisting of items such as Timber (17 02 01), Gypsum (17 08 02), Paper (20 01 01), and Packaging (15 01 01, 15 01 02, 15 01 06), going for recycling under an exemption. 	100%
<p>Landfill/Incineration without energy recovery Waste sent to landfill, other than those in 'Landfill (inert materials for beneficial reuse)', or for incineration without any form of energy recovery.</p>	0%

All off site destinations for waste should be covered by the above. It is also optional to record materials falling into any of the scenarios below.

- The quantity of material that as a result of on site treatment, in accordance with European Waste Directive guidelines, is no longer considered to be a waste; becoming a material/product which is then reused on or off site.
- The quantity of material, which originally was destined for landfill, but that has now been possible to incorporate into the works without any further treatment, for example by adjusting cut and fill levels

⁴ WRAP have a long-term action to provide further guidance on diversion rates for Materials Recovery Facilities

⁵ This figure comes from the CLG Survey of Arisings and Use of Alternatives to Primary Aggregates in England (2005), and will be updated when new data become available.

⁶ This figure comes from WRAP project report CON900-001 CDEW arisings use and disposal for England 2008 which shows that 57% of inert CDEW entering landfills was beneficially reused and therefore exempt from landfill tax.

Recording these figures will not affect the KPIs as the material is not recorded as a waste, but recording them will allow you to identify where projects are taking steps to reduce these waste arisings.

3.0 Units of measurement

Waste should be reported in tonnage wherever possible. Organisations that measure waste by volume should apply standardised volume to mass conversion factors. These factors will take into account both the density of the material and the bulking factor (to allow for void space). The conversion factors used originate from the UK Environment Agency / Environment Agency Wales⁷, and further information is available on the WRAP website⁸.

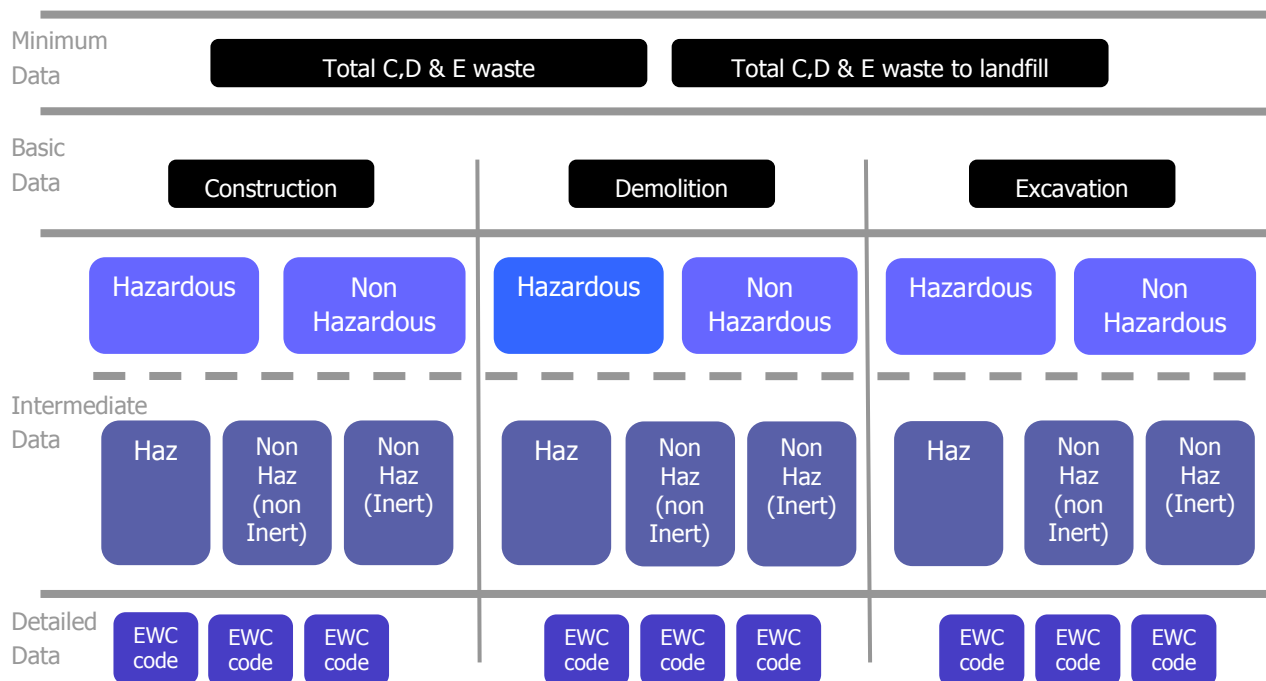
Only primary volume (bulk volume) or mass data, that has not undergone any previous conversion, should be measured. Some site waste management planning tools (e.g. BRE's SMARTWaste) allow entry of data by volume and will convert it to mass and/or apply a compaction factor. If this is the case, the original bulk volume data should be used for reporting purposes, so as not to apply bulking factors twice.

Conversion factors exist for different levels of detail (e.g. activity type > waste stream > EWC code). The basic conversion factors used at the highest level (to convert 1m³ to 1 tonne) are:

- **Construction Waste** (mixed) – 0.87
- **Demolition Waste** (mixed) – 0.87
- **Excavation Waste** – 1.25

4.0 Levels of Recording

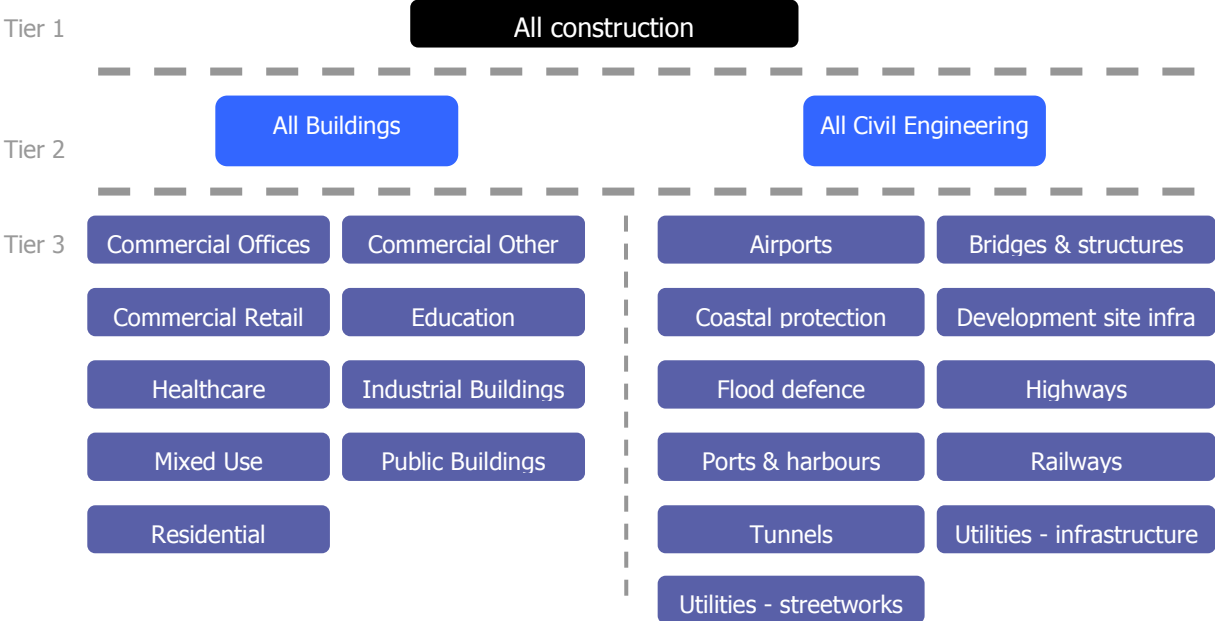
Organisations can choose the level of detail at which they wish to report their data, as illustrated in the diagram below. The four levels are: Minimum, Basic (the minimum for ENCORD members), Intermediate, and Detailed.



⁷ <http://publications.environment-agency.gov.uk/pdf/GEWA0308BNRR-e-e.pdf?lang= e>

⁸ Data report: <http://www.wrap.org.uk/document.rm?id=6932>, spreadsheet: <http://www.wrap.org.uk/document.rm?id=6914>

Data entries can also be tagged by project type. These project types are consistent with both WRAP’s Site Waste Management Plan Template and BRE’s SMARTWaste. ENCORDER members should aim to report at Tier level 2 as a minimum



Finally, organisations may wish to specify whether the data being reported relates to:
 i) New Construction, ii) Refurbishment / Maintenance, or iii) All construction activity.

In the future ENCORDER may develop Waste Reporting Portal to enable organisations to set baselines and targets, record waste data and benchmark performance.

ENCORDER KPIs

The following KPIs are to be used to enable comparison of waste between sectors and project types:

Primary Indicators:

- Total waste arisings: Tonnes of waste generated per €1million of construction output (t/€1million)
- Waste to landfill/incineration without energy recovery: Tonnes of waste disposed of to landfill or via incineration without energy recovery per €1million of construction output (t/€1million)
- Waste recovery: Percentage of waste diverted from landfill/incineration without energy recovery (%)

Secondary Indicators:

- Construction Waste arisings (Building): tonnes of waste generated per m² of construction output (t / m²)
- Construction Waste arisings (Civil engineering): tonnes of waste generated per km of construction output (t / km)

Glossary

Construction, Demolition and Excavation (CD&E) Waste

- **Demolition Waste** – Unwanted material arising from the demolition or strip out of an existing structure.
- **Excavation Waste** – Unwanted material resulting from excavation activities such as a reduced level dig and site preparation and levelling, and the excavation of foundations, basements, tunnels, and service trenches, typically consisting of soils and stones.
- **Construction Waste** – Any other unwanted material produced at the construction site, which is not classified as Demolition or Excavation waste.

Construction cost

Cost in the context of a construction project is the price in the accepted tender or, if there is no tender, the cost of labour, plant and materials, overheads and profit. For a contractor this could be their turnover.

Construction works

For the purpose of reporting construction waste data, the definition of a construction project is taken from the UK Site Waste Management Plans Regulations (2008):

"Construction work" means the carrying out of any building, civil engineering or engineering construction work and includes:

- (a) the construction, alteration, conversion, fitting out, commissioning, renovation, repair, upkeep, redecoration or other maintenance (including cleaning which involves the use of water or an abrasive at high pressure or the use of corrosive or toxic substances), de-commissioning, demolition or dismantling of a structure;*
- (b) the preparation for an intended structure, including site clearance, exploration, investigation (but not site survey) and excavation, and the clearance or preparation of the site or structure for use or occupation at its conclusion;*
- (c) the assembly on site of prefabricated elements to form a structure or the disassembly on site of prefabricated elements which, immediately before such disassembly, formed a structure;*
- (d) the removal of a structure or of any product or waste resulting from demolition or dismantling of a structure or from disassembly of prefabricated elements which immediately before such disassembly formed such a structure; and*
- (e) the installation, commissioning, maintenance, repair or removal of mechanical, electrical, gas, compressed air, hydraulic, telecommunications, computer or similar services which are normally fixed within or to a structure, but does not include the exploration for or extraction of mineral resources or preparatory activities carried out at a place where such exploration or extraction is carried out.*

Container

Any waste receptacle designed to hold waste material prior to and during removal from site. This would include roll-on roll-off containers, skips, compactors, bins, bags, etc.

Diversion rates

This is the percentage of any waste arising that is not sent to landfill or for incineration without energy recovery (with the exception of material going to landfill for beneficial re-use as described in Section 2). Diversion of waste can be achieved through:

- Re-use – the beneficial re-use of materials in their current form (either on-site or off-site);
- Recycling – the reprocessing of wastes, either into the same material (closed-loop) or a different material (open-loop);
- Remediation – the removal of pollution or contaminants from environmental media such that the material can be put to beneficial re-use; and
- Energy recovery – the process of recovering the embodied energy of a material through incineration.

The default Diversion Rates outlined in section 2 will be reviewed every two years, and where revised information is available (from either inside or outside Europe), they will be updated.

Project

"Project" means a project that includes or is intended to include construction work and includes all planning, design, management or other work involved in a project until the end of the construction phase.

Waste

Any substance or object the holder discards, intends to discard or is required to discard is waste under the Waste Framework Directive (European Directive 2006/12/EC), which repeals the European Directive 75/442/EC as amended.