9.0 Waste Management



9.1 Introduction

9.1.1 Wales produced 12.2 million tonnes of construction and demolition (C&D) waste in 2005-06¹⁶. Out of this waste, 56% was re-used on site, 11% was reused off site and 18% was recycled. Whilst this reveals existing good waste management practices, around 1.2 million tonnes (10%) of waste still went to landfill and it is essential that all opportunities are taken to reduce and then reuse C&D waste as a resource if the amount landfilled is to be reduced by 50% by 2015/16¹⁷.

9.1.2 Waste continues to be generated throughout the lifetime of a development as a result of the occupiers' activities. In 2010-11, the total amount of municipal waste, excluding abandoned vehicles, generated in Wales measured 1.62 million tonnes¹⁸. Around 87% of this municipal waste came from households, a total of 1.4 million tonnes. Even though the amount of waste disposed of in landfill continues to fall, it remains the main method of managing municipal waste with 0.8 million tonnes sent to landfill in 2010-11. Sustainable waste management practices are, however, becoming more common with the percentage of municipal waste that was reused, recycled or composted increasing to over 45 percent in 2010-11.

9.1.3 The following sections consider how waste can be reduced in the design and construction of new developments, and how adequate and effective waste management facilities can be incorporated in new developments which facilitate future sustainable management practices.

9.2 <u>Designing Out Waste in New</u> <u>Developments</u>

9.2.1 Guidance prepared by WRAP on designing out waste¹⁹ identifies five key principles that can be used as part of the design process to reduce waste:

- Design for reuse and recovery;
- Design for off-site construction;
- Design for materials optimisation;
- Design for waste efficient procurement; and
- Design for deconstruction and flexibility.

Reuse and Recovery

9.2.2 The reuse of material components and/or entire buildings reduces waste by extending the effective life of existing materials and minimises

¹⁶ Environment Agency Wales. Building the Future 2005-2006: A Survey on the Arising and Management of Construction and Demolition Waste in Wales 2005-2006. (Cardiff, EAW).

¹⁷ Target set out in Towards Zero Waste – The Overarching Waste Strategy Document for Wales, June 2010.

¹⁸ Welsh Government. 2011. Statistical Bulletin SB105/2011. (Cardiff, WG).

¹⁹ Davis Langdon LLP. Designing Out Waste: A Design Team Guide for Buildings. Less Waste, Sharper Design (Banbury, Waste and Resource Action Programme (WRAP)).

the demand for new resources which have their own environmental impacts (e.g. embodied energy and CO2 emissions). It also lowers material purchasing costs and reduces handling and disposal costs.

9.2.3 Reuse can involve the refurbishment or conversion of existing buildings, the reuse of materials or components from demolition on site, or the reuse of materials or components that have been salvaged from other sites²⁰.

9.2.4 Where demolition and site clearance is an essential part of the development, consideration should be given to the following:

- the potential for materials from the demolition of existing buildings or other phases to be reused in the design of the new development;
- the potential to reuse reclaimed products or components;
- the reuse of materials at their highest value;
- the potential to reuse excavation materials; and
- the need to optimise a cut and fill balance in order to minimise the removal of spoil off site.

9.2.5 Where no opportunities exist for reusing materials and/or components, the recovery of materials through recycling should be maximised by implementing good practice.

Offsite Construction

9.2.6 Off site factory production has the potential to considerably reduce waste especially when factory manufactured elements and components are used extensively. This method of construction uses prefabricated building components that are efficiently assembled on site. Benefits of this method include: shortened construction timescales; reduced construction related transport movements; reduced site waste through improved workmanship quality and reduced site errors; and efficient reuse and recycling of factory generated waste.

Materials Optimisation

9.2.7 Design approaches that give adequate consideration to the efficient use of materials, can deliver developments that minimise the use of materials in their design, and/or produce less waste during construction, without compromising the overall design concept. Effective ways of reducing waste include: minimising excavation and/or optimising the cut and fill balance; simplifying and standardising material and component choices to encourage reuse of off cuts; and incorporating dimensional co-ordination which minimises excess cutting and jointing of materials that generate waste.

Waste Efficient Procurement

9.2.8 The sequence of construction activities can affect the generation of waste and it is important to understand and identify how the causes of waste can be 'designed out'. An important aspect of this is to work with contractors and other specialist subcontractors and set tight specifications of work procedures and clear contractual targets.

Deconstruction and Flexibility

9.2.9 Materials can potentially be recovered during the life of the building when maintenance and refurbishment is being undertaken or when the building reaches the end of its life. Generally, construction methods that enable efficient disassembly should be chosen in preference to the more contiguous structural systems. Designs using prefabricated building elements, components and materials tend to lend themselves to more efficient reuse and recycling.

9.2.10 In order to increase opportunities for reducing waste at the deconstruction stage, consideration should be given to the following:

 designing adaptable buildings that can be used for a variety of purposes during its operational life;

²⁰ It should be noted that an exemption or Environment Permit may be required from Natural Resources Wales to carry out waste activities such as the reuse of waste in construction.

- the use of building elements and components that can be maintained upgraded or replaced without generating waste;
- incorporating reusable/recyclable materials and components into the design of the building;
- the ease in disassembling building elements, components and materials; and
- the creation of a Building Information Modelling (BIM) system or building handbook which records which and how elements, components and materials have been designed for disassembly.

9.3 <u>Incorporating Waste</u> <u>Management Facilities in</u> <u>New Developments</u>

9.3.1 The need to provide suitable opportunities for the storage and collection of waste is an important consideration in the design of new developments. In general, new developments will need to provide on-site residual waste, recycling and composting storage and collection facilities. Adequate access arrangements for refuse vehicles and workers for collection purposes will also be required.

9.3.2 In residential developments, provision should be made for separate internal and external storage of compostable waste, dry recyclables and residual waste. Communal facilities, which may be necessary for larger developments, should be appropriately sized to facilitate the adequate separation of waste streams and secure to prevent misuse. In all instances, storage areas should be located within the property boundary and be visible and accessible to residents in order to encourage use. The use of signage and labelling will assist residents in identifying and appropriately using waste facilities.

9.3.3 Commercial developments should also provide adequate storage space for composting, recycling and residual waste. The provision of a compactor or baler should also be considered. Bin provision and storage requirements will need

to reflect the collection frequency and specific requirements of the selected contractors. All waste must be containerised and stored off the public highway.

9.3.4 Mixed developments, such as commercial and residential, will need to provide separate storage facilities and collection arrangements. Commercial waste must not be mixed with residential waste.

9.3.5 It is important to ensure that new developments provide appropriate access arrangements for waste collection. These should include:

- appropriate space for refuse collection vehicles to pull up and collect waste containers which minimises the travel distance from the vehicle to kerbside collection points;
- adequate access arrangements that enable residents or staff to safely move containers to collection points;
- sufficient space for a collection vehicle and workers to safely manoeuvre when collecting waste containers from nonkerbside collection points; and
- adequately sized access pathways and service roads which are free of obstruction with suitable dropped kerbs and crossovers.

9.3.6 The operation of the waste collection service should be an integral part of the street design and achieved in ways that do not compromise quality of place. Care should however be taken to avoid designs which severely restrict access by waste collection vehicles and cause the creation of undesirable, ad hoc communal collection points, which inconvenience the householder and collection service.