

RECAP Partnership: Waste Management Design Guide

Recycle for Cambridgeshire and Peterborough

Draft SPD for consultation



February 2010

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LOCAL AUTHORITY CONTACT DETAILS

Cambridge City Council

The Guildhall, Cambridge, CB2 3QJ.

Tel: (01223) 457 000

Status: Waste Collection Authority Local Planning Authority

Cambridgeshire County Council

Shire Hall, Castle Hill, Cambridge, CB3 0AP.

Tel: (01223) 717111

Status: Waste Disposal Authority Waste Planning Authority County Planning Authority

East Cambridgeshire District Council

The Grange, Nutholt Lane, Ely, Cambridgeshire, CB7 4PL.

Tel: (01353) 665555

Status: Waste Collection Authority Local Planning Authority

Fenland District Council

Fenland Hall, County Road, March, Cambridgeshire, PE15 8NQ.

Tel: (01354) 654321

Status: Waste Collection Authority Local Planning Authority

Huntingdonshire District Council

Pathfinder House, St Mary's Street, Huntingdon, Cambridgeshire, PE29 3TN.

Tel: (01480) 388388

Status: Waste Collection Authority Local Planning Authority

Peterborough City Council

Bayard Place, Broadway, Peterborough, PE1 1FB.

Tel: (01733) 747474

Status: Waste Disposal Authority Waste Collection Authority Waste Planning Authority Local Planning Authority

South Cambridgeshire District Council

South Cambridgeshire Hall, Cambourne Business Park, Cambourne, Cambridge, CB23 6EA.

Tel: 08450 450 500

Status: Waste Collection Authority Local Planning Authority

EXECUTIVE SUMMARY

This Guide is consistent with a drive towards sustainable waste management. The intention is that following public consultation this Waste Management Design Guide will be adopted by Cambridgeshire County Council and Peterborough City Council as a Supplementary Planning Document and as such will form part of the Cambridgeshire and Peterborough Minerals and Waste Local Development Framework (LDF).

A number of key points can be drawn from this document and should be regarded as essential considerations when designing for effective waste management.

Where reference is made to residents and users of a service, throughout this Guide, this includes users/residents with disabilities and therefore their regard (in accordance with the Disability Discrimination Act 1995).

1. This Guide puts significant emphasis on timely consultation with the relevant Local Authority. This forms the backbone of ensuring effective design for waste management. In most cases this should form part of the collaborative process outlined in the Cambridgeshire Design Guide for Streets and Public Realm. The Guide also offers a significant opportunity for innovation in waste management design and actively welcomes proposals from developers for alternative waste management solutions. Such proposals will form part of the consultation process and should be well researched, demonstrate realistic solutions being clearly presented and accompanied by accurate costings.
2. Within residential developments, developers are required to provide adequate space for internal and external storage of waste based on figures outlined in this document and fund such provision. In both cases, developers will also have to fund and provide appropriate containers. For commercial developments adequate external space will have to be provided based on consultation with the Local Authority. Additional storage space will also have to be provided at commercial developments to satisfy legislative requirements.

3. Waste storage areas should be accessible to all users and should not present an unnecessary health and safety risk. The method of transit of waste to a storage point will depend upon the type of development. For single houses it will typically be residents transferring their waste to containers located within the boundaries of their property. In developments of flats and apartments typical options will be residents transferring their waste to communal bins, waste chutes or a Facilities Management service. The developer should make adequate arrangements for the management and maintenance of all communal waste transit and storage infrastructure in all developments of flats and apartments.
4. Flats and apartments present a challenging issue to waste management and various options are open to a developer beyond the provision of hard infrastructure and typical methods of treatment. Waste management in such developments requires an integrated approach and innovation is welcomed. Further guidance is provided in the section entitled “An Integrated Approach to Waste Management in Flats and Apartments” and the Case Studies also presented in this document.
5. Waste storage systems should be provided within developments of flats and apartments and at commercial developments in accordance with the requirements of this Guide. Initial design of such systems should provide assessment of (amongst others): on-site treatment options; access; health and safety; security; and protection of the environment. Developers are encouraged to consider the potential for underground waste storage in their developments – serving flats and apartments or as bring sites (as defined in Part 9 of the Design Guide) for wider public use. An underground waste storage Case Study is presented in this document.
6. Although contemporary urban design is shifting away from the dominance of places by roads, access for Local Authority waste collection vehicles must be considered in relation to the design of new highways. Together the local authorities in Cambridgeshire and Peterborough provide a waste collection and disposal service for their residents, for which there is required infrastructure. Wherever possible, access should be adequate and avoid the need for vehicles to undertake unnecessary or difficult

manoeuvres. However, it is recognised that the passage of a large waste collection vehicle may not offer the best solution for a particular development. In such cases, opportunities for innovation exist and the Cambridgeshire and Peterborough (RECAP) Partnership (comprising of Cambridgeshire County Council, Peterborough City Council and the District Councils in Cambridgeshire) welcome alternative waste collection ideas (though it must be noted that the additional capital and revenue costs of any such alternatives will be required to be funded by the developer).

7. Local Authority waste collection will not commence until road surfaces are complete to base layer and access is not unreasonable (refer to Environmental Protection Act S.45) and not hindered by ongoing construction work. In these circumstances, and where a development requires a waste collection service, provision will have to be made by the developer at their cost.
8. A network of Household Recycling Centres is operational across the Cambridgeshire and Peterborough area. Continued development will put pressure on the existing facilities and require development of the network. Reasonable financial contributions, in accordance with Circular 05/05 or as required as part of the Community Infrastructure Levy will be secured from developers using Section 106 Agreements or other legal agreements as appropriate. Where applicable, developers will also have to make land available at strategic locations.
9. Developers may be required to provide additional Bring Sites, upgrade existing facilities in the locality in accordance with Circular 05/05 or as required as part of the Community Infrastructure Levy, pay a reasonable financial contribution to the relevant Local Authority for provision or upgrade. The choice will be dependent on an assessment by the developer of the need for such facilities and the impact of the development on existing infrastructure (including the preparation of a waste audit as required by the Minerals and Waste Core Strategy).

10. RECAP are actively seeking to engage developers in schemes of education to promote the aims of effective waste reduction and recycling. It should be recognised that a developers marketing strategy can be enhanced by developing education schemes to encourage further recycling and composting in partnership with RECAP.

Part 1: Introduction

This Waste Management Design Guide (the Guide) addresses the issue of waste management in new developments and redevelopments of a residential, commercial or mixed (residential and commercial) nature. It is to be used by:

- Developers and designers to ensure effective segregation, storage and collection of waste materials; and
- Planning Authorities in assessing each planning application to ensure that waste management needs are adequately addressed.

The intention is that following public consultation and the adoption of the parent Minerals and Waste Core Strategy this Waste Management Design Guide will be adopted by Cambridgeshire County Council and Peterborough City Council as a Supplementary Planning Document. It is anticipated that this will be in mid 2011.

The Design Guide was originally produced by the Recycling in Cambridgeshire and Peterborough (RECAP) Partnership (comprising of Cambridgeshire County Council, Peterborough City Council and the District Councils in Cambridgeshire) and WISER Environment Ltd and has subsequently reviewed for consistency with the Cambridgeshire and Peterborough Minerals and Waste Development Plan.

1.1 Purpose of the Guide

This Guide has been created to:

1. Detail the waste segregation, storage and collection requirements that designers and developers need to satisfy.
2. Provide a strategic tool for use by Planning Authorities when assessing development applications.

3. Address the unique waste management problems presented by high density developments.
4. Expand upon the requirements as set out in the Minerals and Waste Core Strategy for developer obligations relating the funding and provision of waste management infrastructure.
5. Highlight the financial implications of waste management upon developers.
6. Highlight examples of good practice demonstrating what can be achieved.
7. Contribute to sustainability and reduced environmental impact.

Therefore it is anticipated that a waste audit will also be used as a mechanism for demonstrating developer proposals meeting the requirements of this Guide.

Requirements for residential and commercial developments (including the redevelopment of existing sites) relating to waste minimisation, waste recovery, recycling and associated infrastructure are set out in the following policies in the Submission Draft Cambridgeshire and Peterborough Minerals and Waste Core Strategy.

CS28 - Waste Minimisation, Re-use, and Resource Recovery

- The Waste Planning Authorities will encourage waste minimisation, re-use and resource recovery through requiring:
- a waste management audit and strategy to put in place practicable measures to maximise waste minimisation, sorting, re-use, recovery and recycling of waste on all developments over the value of £300,000
- Residential and commercial developments to submit a completed RECAP Waste Management Design Guide Toolkit assessment and provision for waste storage, collection and recycling consistent with the RECAP Waste Design Guide
- new housing development will contribute to the provision of Bring Sites. Contributions will be consistent with the RECAP Design Guide and

additionally in Peterborough the Planning Obligations Implementation Scheme.

- temporary waste recycling facilities in strategic development areas including the Cambridge and Peterborough development areas, Northstowe, and St Neots. These should maximise the reuse, recycling and recovery of inert waste streams from construction and demolition operations, and be in place throughout the construction phases of these major development areas.

CS16 – Household Recycling Centres

A network of household recycling facilities easily accessible to local communities will be developed through the Site Specific Proposals Plan. New household recycling centres will be in the following broad locations:

Cambridge East

Cambridge North

Cambridge South

Northstowe

March

Peterborough

New housing development will contribute to the provision of household recycling centres.

Contributions will be consistent with the RECAP Waste Guide in Cambridgeshire, or the Planning Obligations Implementation Scheme in Peterborough.

There are two design related SPDs linked to the Minerals and Waste Plan, both of which are relevant to waste management facilities. The focus of the

RECAP Design Guide is the waste management facilities which are to be provided as part of residential and commercial developments allowing for the segregation of waste for recycling and composting. This includes establishing the need for and the design of expanded and/or additional expanded Bring Sites (e.g. for bottles, paper and can recycling etc.) and also identifying whether there could be a need for an expanded or new Household Recycling Centre to serve the development where appropriate.

However, it is important to note that there is an additional Supplementary Planning Document on the Location and Design of Waste Management Facilities which sets out the principles of relating to the design of waste management facilities in both urban and rural areas including Household Recycling Centres to ensure that future waste management development is of the highest standard in relation to layout, access, appearance and environment and the use of materials.

1.2 Compliance with this Guide and the RECAP Waste Management Design Guide Toolkit

This Guide contains the RECAP Waste Management Design Guide Toolkit that will allow a developer, in consultation with the Local Authority, to make an effective evaluation of the waste management requirements upon them and demonstrate compliance as necessary. The intention is that following adoption of the Cambridgeshire and Peterborough Minerals and Waste Core Strategy all proposals must demonstrate use of the toolkit and submit it, as complete, with their plans.

The Toolkit is presented from p.57 and is made up of 3 tools as described in Table 1 below. The tools are interlinked and refer to each other as appropriate.

Table 1: The RECAP Waste Management Design Guide Toolkit

Toolkit Components		
Design Standards Checklist	Assessment Criteria	Basis for Conditions and Agreements
Developers will be expected to demonstrate that their proposals satisfy the requirements of this Guide by assessing their proposals against the expected standards which are brought together under the Design Standards Checklist.	Depending upon development proposals, it may be that a developer is required to conduct a wider assessment of the impact of their scheme (or aspects thereof). Criteria for such an assessment are presented under the Assessment Criteria.	For some developments it may be appropriate to apply planning conditions or negotiate S106 agreements relating to several factors as detailed under the Basis for Conditions and Agreements.

The TOOLKIT should be used as follows:

Design Standards Checklist	Applies to all developments. To be used and completed by the developer and supported by plans and/or documents as appropriate.
Assessment Criteria	To be completed by the developer where proposals involve the construction of waste storage compound(s) and/or installation of Bring Site infrastructure and/or

	alternative schemes.
Basis for Conditions and Agreements	To be utilised by the Local Planning Authority as appropriate in relation to the provision of waste storage containers the Recycling Centre network and the Bring Site network.

The Toolkit should be viewed as an integral part of a waste audit.

1.3 Consultation

This Guide puts significant emphasis on timely consultation with the relevant Local Authority. This forms the backbone of ensuring effective design for waste management. In most cases, consultation should form part of the collaborative process outlined in the Cambridgeshire Design Guide for Streets and Public Realm.

1.4 Alternative schemes

This Guide offers a significant opportunity for innovation in waste management design and actively welcomes proposals from developers for alternative waste management solutions. For example, underground storage of waste or alternative methods of waste collection may be more amenable to a particular development than typical methods of storage and collection. Whatever the situation, alternative proposals must be discussed with the Local Authority and be well researched, demonstrate realistic solutions and be clearly presented. Accurate costing will also be required and developers must note that they will be required to fund any such schemes where costs exceed the amount the Local Authority would otherwise pay for a standard service and provide any non-standard infrastructure for the scheme.

Any such schemes must, at the very minimum, be assessed against the criteria detailed under Assessment Criteria.

Part 2: Policy and Planning Context

A number of documents are highlighted below because of either their national/regional importance or because of the considerable future importance they will have. They demonstrate the increasing importance of waste management and the continuing shift both within the region and nationally towards sustainable waste management practice – something that this Guide can make a positive contribution towards.

2.1 Waste Strategy for England 2007

Waste Strategy 2007 broadly seeks to ensure that England will meet and exceed Landfill Directive Diversion Targets for biodegradable municipal waste in 2010, 2013 and 2020. A key proposal for the new strategy is to incentivise efforts to reduce, reuse and recycle waste and to improve local governance to deliver better co-ordinated action on the ground. It supersedes the existing Waste Strategy published in 2000.

The fundamental principle behind the strategy is the waste hierarchy which seeks to encourage wherever possible waste prevention (ultimate aim) followed by re-use, recycling/composting and energy recovery. Disposal features in the waste hierarchy as the least favoured option.

The strategy sets a number of national targets for waste management (detailed under Part 3) and seeks to achieve several Government key objectives:

- decouple waste growth (in all sectors) from economic growth and put more emphasis on waste prevention and re-use;
- meet and exceed the Landfill Directive diversion targets for biodegradable municipal waste in 2010, 2013 and 2020;
- increase diversion from landfill of non-municipal waste and secure better integration of treatment for municipal and non-municipal waste;
- secure the investment in infrastructure needed to divert waste from landfill and for the management of hazardous waste; and

- get the most environmental benefit from that investment, through increased recycling of resources and recovery of energy from residual waste using a mix of technologies.

The main elements of the strategy, in order to achieve the key objectives can be summarised as:

- incentivise efforts to reduce, re-use, recycle waste and recover energy from waste;
- reform regulation to drive the reduction of waste and diversion from landfill while reducing costs to compliant businesses and the regulator;
- target action on materials, products and sectors with the greatest scope for improving environmental and economic outcomes;
- stimulate investment in collection, recycling and recovery infrastructure, and markets for recovered materials that will maximise the value of materials and energy recovered; and
- improve national, regional and local governance, with a clearer performance and institutional framework to deliver better coordinated action and services on the ground.

2.2 Planning Policy Statement 10: Sustainable Waste Management

Planning Policy Statement 10 (PPS10) sets out the Government's national policy on waste management land-use planning in England. It replaces Planning Policy Guidance Note 10, Planning and Waste Management, published in 1999 and forms part of the national waste management plan for the UK. It makes specific reference to the importance of good design in waste management:

35. Good design and layout in new development can help to secure opportunities for sustainable waste management, including for kerbside collection and community recycling as well as for larger waste facilities. Planning authorities should ensure that new development makes sufficient

provision for waste management and promote designs and layouts that secure the integration of waste management facilities without adverse impact on the street scene or, in less developed areas, the local landscape.

36. Waste management facilities in themselves should be well-designed, so that they contribute positively to the character and quality of the area in which they are located. Poor design is in itself undesirable, undermines community acceptance of waste facilities and should be rejected.

2.3 Planning Policy Statement 1: Planning for Sustainable Development

Planning Policy Statement 1 (PPS1) refers to the need for development plans to address the issue of waste management and include provision for additional infrastructure. This SPD is intended to supplement the relevant policies in Minerals and Waste Core Strategy to ensure that waste management infrastructure and related issues are addressed as part of planning applications.

2.4 Planning Policy Statement 1: Planning and Climate Change - Supplement to Planning Policy Statement 1

This document supplements PPS 1 out and set outs how planning, in providing for the new homes, jobs and infrastructure needed by communities, should help shape places with lower carbon emissions and resilient to the climate change now accepted as inevitable.

The relevant principles relating to waste management facilities are as follows:

- The proposed provision for new development, its spatial distribution, location and design should be planned to limit carbon dioxide emissions;
- New development should be planned to make good use of opportunities for decentralised and renewable or low carbon energy;

- New development should be planned to minimise future vulnerability in a changing climate;

Mitigation and adaptation should not be considered independently of each other, and new development should be planned with both in mind.

2.5 The East of England Plan

The East of England Plan which was published in May 2008 supersedes the existing Regional Planning Guidance and the majority of Structure Plan policies within the region. New Waste Policies were developed after a significant amount of additional work was carried out by the East of England Regional Assembly (EERA) with taking into account the advice of the Waste Planning Authorities within the Region.

Policy WM1 details regional objectives for waste management which include:

- to minimise the impact of new development, particularly the concentrations of growth in the Key Centres of Development and Change, on regional waste management requirements
- to enlist and encourage community support and participation in promoting responsible waste behaviour and approaches to management, viewing waste as a resource and maximising re-use, recycling, composting and energy recovery.

The supporting text relating to Policy WM8 which relates to actions for waste disposal and collection authorities states that:

To maximise recycling and composting, waste disposal authorities and waste management companies should encourage composting or biodigestion of biodegradable wastes. In addition to providing for the collection of separated biodegradable waste and green waste composting, initiatives such as home composting...should be supported.

Development should be designed and constructed to minimise the creation of waste, make maximum use of recycled materials and facilitate the collection, separation, sorting, recycling and recovery of waste arising from the development and surrounding areas, where appropriate. Within major developments provision should be made for waste management facilities to enable the sustainable management of waste through innovative approaches to local waste reduction, recycling and management.

2.6 Cambridgeshire and Peterborough Minerals and Waste Local Development Framework

Each District Council and Unitary Authority is required to produce a portfolio of Local Development Documents (LDDs). LDDs comprise:

- **Development Plan Documents (DPDs)** - spatial planning documents prepared by the relevant planning authority and subject to independent examination by a Planning Inspector appointed by the Secretary of State
- **Supplementary Planning Documents (SPDs)** -cover a wide range of issues on which the planning authority wishes to provide guidance to supplement the policies and proposals in the DPDs. They will not form part of the Development Plan or be subject to independent examination, but their programme of preparation must be set out.
- **Statement of Community Involvement (SCI)** -sets out the standards for involving the community in the preparation, alteration and continual review of all LDDs.

Matters relating to minerals and waste for the area are the responsibility of Cambridgeshire County Council and Peterborough City Council and, together, the Councils are drafting the Cambridgeshire and Peterborough Minerals and Waste Local Development Framework.

The Minerals and Waste Plan which forms part of the Framework will set out land use policies and allocations for both minerals extraction and waste management encompassing all waste streams over the period 2006 to 2026. It will be a comprehensive document which when adopted in 2011 will supersede the Cambridgeshire Aggregates (Minerals) Local Plan and the Cambridgeshire and Peterborough Waste Local Plan. The Cambridgeshire and Peterborough Minerals and Waste Plan is the “parent” document to which the Design Guide is linked.

2.7 Supplementary Planning Document -The Location and Design of Waste Management Facilities

Cambridgeshire County Council and Peterborough City Council adopted this Supplementary Planning Document (SPD) on 28 April 2006. This SPD has been prepared to assist in the delivery of high quality sustainable waste management facilities where these are not covered in this Guide. The document sets out a series of key development principles based on recognised good planning and design practice. More recently the content of this SPD has been reviewed and its scope widened beyond major facilities to ensure that it is consistent with the policies of the emerging Cambridgeshire and Peterborough Minerals and Waste Core Strategy. A separate public consultation relating to this document is currently underway.

2.8 Cambridgeshire and Peterborough Joint Municipal Waste Management Strategy

The Cambridgeshire and Peterborough Waste Partnership (RECAP) was formed in 1999 and the first Strategy written in 2002 outlining current and planned arrangements for waste collection, recycling, composting and other waste treatments for 2002 through to 2022. The Strategy was refreshed in 2007/08.

2.9 Cambridgeshire County Council Household Recycling Centre Strategy

This document sets out Cambridgeshire's strategy for delivering Household Recycling Centres as a resource to the public and as an aid to meeting statutory waste to landfill diversion targets.

2.10 Current Status of this Design Guide

This Guide is consistent with a drive towards sustainable waste management at a local, regional and national level and in its current form is a best practice guidance document. In the longer term it is proposed that the Guide be adopted as a Supplementary Planning Document (SPD) under the new Cambridgeshire and Peterborough Minerals and Waste Local Development Framework following the likely adoption of that document in June 2011, having been subjected to all necessary procedural arrangements.

Part 3: Waste Management in Context

3.1 Introduction

The popularity of the Cambridgeshire and Peterborough areas to both the wider population of the UK and businesses alike is has led to a significant increase in population in recent years. This means changes in the way waste is managed and a renewed effort to further the significant strides that have already been made towards the reduction, reuse and recycling of waste in the area.

As costs of waste management rise, the increasing number of businesses and commercial developers attracted to the area need to seriously consider increased segregation of wastes and the recovery of value that this can bring.

The following section outlines the likely influences on waste generation and the predicted quantities that we will have to manage.

3.2 Population and Housing in Cambridgeshire and Peterborough

By 2021, the total population for Cambridgeshire and Peterborough is predicted to be 902,100 (East of England Plan, Annual Monitoring Report 2007-08) representing an increase of 190,000 from the 2001 figure.

Dwelling distribution is detailed in the following table.

Table 2: Minimum Dwelling provision required in Cambridgeshire and Peterborough (2001 – 2021)

Area	Minimum Dwelling Provision in Cambridgeshire and Peterborough (2001 – 2021)
Cambridge City	19,000

East Cambridgeshire	8600
Fenland	11,000
Huntingdonshire	11,200
South Cambridgeshire	23,500
Peterborough	25,000
Total	98,300

(Source: East of England Plan, May 2008, Policy H1)

3.2 Generation of Waste

3.2.1 At a Local Level

Current predictions suggested based upon the scale of housing growth set out in the East of England Plan there will be an increase in the amount of municipal waste of 3.9% in 2005, falling to 1.1% by 2015 and continuing at that rate thereafter.

This amount of municipal waste which is expected to be generated between 2006 and 2026 within Cambridgeshire and Peterborough is approximately 11,233,000 million tonnes.

Source: Cambridgeshire and Peterborough Minerals and Waste Plan Core Strategy, February 2010

In the 12 month period 2006 – 2007 the following quantities of household waste were collected:

- Cambridgeshire County Council ~306,032 tonnes.
- Peterborough City Council ~93,670 tonnes.

(Source:RECAP)

The following table shows how this waste was disposed of during the 2006/07 period.

Table 3: Waste Destinations in Cambridgeshire and Peterborough 2006 - 2007

	Cambridgeshire County Council	Peterborough City Council
Waste Destination	% of Total Household Waste	% of Total Household Waste
Landfill	51.5	56
Recycle/ Compost	48.5	44

(Source: RECAP)

It is clear that excellent progress has been made in diverting waste materials from landfill, with recycling a well established practice within the area. This Guide seeks to reinforce and further this good practice by enabling increased waste segregation, providing appropriate storage for materials and allowing efficient collection.

3.2.2 National Targets

The UK Government sets a number of national targets for the management of wastes. The targets can be summarised as follows:

Landfill Directive Targets:

- 2010 – to reduce the amount of waste going to landfill to 75% of 1995 levels
- 2013 – 50% of 1995 levels
- 2020 – 35% of 1995 levels

(Source: DEFRA)

The Waste Strategy for England 2007 sets National Targets for recycling and composting:

- To recycle/compost at least 40% by 2010
- At least 45% by 2015
- At least 50% by 2020

Also set are national targets for the recovery of municipal waste:

- To recover 53% of municipal waste by 2010
- 67% by 2015
- 75% by 2020

(Source: DEFRA)

This Guide will contribute to ensuring that the area satisfies and exceeds these targets wherever possible.

3.2.3 Landfill Allowance Trading Scheme Targets

The Waste and Emissions Trading Act (2003) places a duty on Waste Disposal Authorities to reduce the amount of biodegradable municipal waste going to landfill.

Landfill allowances have been allocated to each authority at levels appropriate to allow England to meet its contribution to the UK Landfill Directive targets (as illustrated above) through the Landfill Allowance Trading Scheme (LATS). The table below illustrates LATS targets for Cambridgeshire and Peterborough:

Table 4: LATS Targets for Reductions in Biodegradable Municipal Waste to Landfill

Authority	2009 Target (tonnes of biodegradable municipal waste)	2013 Target (tonnes of biodegradable municipal waste)	2020 Target (tonnes of biodegradable municipal waste)
Cambridgeshire County Council	109,638	73,026	51,099
Peterborough City Council	34,135	22,736	15,909

(Source: RECAP)

Though landfill allowances can be traded, saved or borrowed, they are not infinite in supply and where an authority fails to meet its targets they will be liable to a financial penalty of £150 (as currently set) for each tonne of waste over their allowance.

3.2.4 Recycling Targets in Cambridgeshire and Peterborough

RECAP has established long term voluntary targets for recycling across Cambridgeshire and Peterborough. These are illustrated in Table 4 below.

Table 5: Recycling Targets for Cambridgeshire and Peterborough (Voluntary)

Year	Destination	% of Total Household Waste
2010	Recycle/Compost	45 – 50
2015	Recycle/Compost	50 – 55
2020	Recycle/Compost	55 - 65

(Source: RECAP)

The Local Authorities in the area demonstrate high performance in recycling and the diversion of waste from landfill and though future waste management requirements present a challenge, every confidence exists that targets can be achieved.

Part 4: Waste Storage Capacity

4.1 Introduction

The amount of waste storage required for any given development type is determined by a number of factors including:

- Volume and composition of waste;
- Segregation;
- Any on-site treatment; and
- Collection frequency.

It is essential that adequate provision is made for waste segregation, storage and collection to encourage participation in effective waste management and to act as a frontline tool in waste education. However, this approach must be pragmatic and address actual needs of a particular development without sacrificing valuable space unnecessarily.

4.2 Residential Developments

The storage capacities illustrated here are applicable to single houses and flats and apartments.

4.2.1 Internal Storage Capacity

Internal storage capacity is fundamental in ensuring that residents have sufficient space and undertake segregation at the very point of waste production and it is expected that developers will provide internal containers.

An internal capacity of 35 to 40 litres should be provided within the kitchen of a dwelling. Typically, this capacity should be divided to allow segregation of residual waste, mixed dry recyclables and, where appropriate, organics for

composting. This means that developers should provide internal waste storage containers that are easily replaceable.

As an aid to the design process and to enable a sensible choice of kitchen furniture, Appendix A contains detail and specifications on a selection of internal waste storage containers.

4.2.2 External Storage Capacity

At the very least, developers will be required to provide the appropriate amount of space into which will fit the required external storage containers. As a guide to external container size, specifications are presented at Appendix A.

Developers may also be required to provide the external containers or pay a reasonable financial contribution to the relevant Local Authority for their provision, through for example appropriate Section 106 agreements in accordance with Circular 05/05 or as required as part of the Community Infrastructure Levy (where waste management infrastructure is included). Developers should discuss these issues with the Local Planning Authority and Waste Collection Authority at the earliest opportunity, prior to submitting their planning application. Reference should be made to the Basis for Conditions and Agreements which details potential conditions or agreements that a developer may be legally obligated to satisfy.

In any case, external containers must be in place in-time for occupation of a property and prior to the commencement of any Local Authority waste collection service.

The following table illustrates recommended external storage capacities for various types of residential development based on alternate weekly collections. Where reference is made to a '1 room unit', '2 room unit', etc all

'living' rooms (i.e. lounge, dining room, bedrooms) are counted. The kitchen and bathroom are excluded.

Table 6: Recommended External Storage Capacities (Residential)

Residential Development Type	Aggregated Capacity Provision		Guidance Notes
Single House	775 litres		Capacities detailed are maximum capacity 'footprints'. Developers should ensure that sufficient space is provided for the appropriate external storage containers. The relevant Local Authority must be consulted on capacity split and the types of external storage containers that
Low-rise (to 4 floors) With communal gardens	For each 1 room unit	320 litres	
	For each 2 room unit	420 litres	
	For each 3 room unit	520 litres	
	For each 4 room unit	620 litres	
	For each 5 room unit	720 litres	
Low-rise (to 4 floors) Without communal gardens	For each 1 room unit	240 litres	
	For each 2 room unit	340 litres	
	For each 3 room unit	440 litres	
	For each 4 room unit	540 litres	

	For each 5 room unit	640 litres	the developer will be required to provide. It should be noted that capacity 'footprints' and splits will change overtime as each Local Authority works towards national targets.
High-rise (above 4 floors)	For each 1 room unit	240 litres	
	For each 2 room unit	340 litres	
	For each 3 room unit	440 litres	
	For each 4 room unit	540 litres	
	For each 5 room unit	640 litres	

For flats/apartments, capacity is unlikely to be provided on an individual residence basis. Capacity calculated for each unit should be combined giving a total. This should then be converted to the required number of communal bins (where calculations result in a fraction, figures should be rounded up or down as appropriate).

For example: A developer has constructed a low-rise 4 floor development (without communal gardens) of 16 flats – 8 are 2 room units and 8 are 3 room units. Waste capacity should be:

$$(8 \times 340 \text{ litres}) + (8 \times 440 \text{ litres})$$

$$= 6240 \text{ litres total capacity}$$

In terms of external storage containers this may equate to:

3 x 1100 litre bins for residual waste; 4 x 660 litre bins for dry recyclables; 1 x 360 litre bin for compostables.

Flats/apartments (particularly those of a high-rise nature) represent a challenging issue for waste management and these are further addressed under An Integrated Approach to Waste Management in Flats and Apartments. For further information relating to the type of containers required please contact the relevant Waste Collection Authority.

4.2.3 Commencement of Collection Service

Arrangements must be made with the Local Authority to ensure waste containers are in place on occupation of any properties to enable a collection service to commence. Further considerations for the commencement of a collection service, are outlined under Part 7.5.

4.3 Commercial Developments

4.3.1 Typical Capacities

Recommended total waste storage capacities for a number of commercial development types are summarised in the table below. These volumes are not generally applicable minimums due to the variations in activity and output that can occur across and within these development types. It is essential that consultation is undertaken with the relevant authority as to anticipated waste arisings in order to establish an effective waste management programme.

Table 7: Recommended Storage Capacity (Commercial)

Commercial Development Type	Waste Storage Capacity	Fraction of Capacity for Storage of Recyclables
Offices	2600 litres per 1000m gross floor space	Minimum of one third
Retail	5000 litres per 1000m gross floor space	Minimum of one third

Restaurants/ Outlets	Fastfood	1500 litres per 20 dining spaces	Variable
Hotels		5000 litres per 20 dining spaces	Variable

(Source: City of Westminster Council)

Typically, commercial developments are provided with large 4-wheel bins, but provision will be dependent upon anticipated waste generation. Specifications of typical waste storage containers are detailed at Appendix A.

4.3.2 Further Considerations - Commercial

Three pieces of key legislation further affect commercial enterprises:

The Hazardous Waste Regulations 2005 make it a legal requirement to separate all hazardous wastes before collection for disposal. This includes fluorescent tubes, computer monitors and batteries.

The Waste Electrical and Electronic Equipment (WEEE) Regulations 2006 make the recycling and recovery of such waste types compulsory.

The Landfill Directive makes the initial separation of waste types essential prior to any landfilling.

4.4 Skip Containers and Waste Compaction Systems

It may be appropriate to make use of skip containers and waste compaction systems at high-rise multi-occupancy developments and in commercial developments. Details on skip containers/compaction systems are presented at Appendix B.

It must also be noted that where the use of a compactor is being considered, evaluation must be given to servicing and wider infrastructure requirements – i.e. adequate access for suitable collection vehicles must be provided along with adequate working areas and the wider road network must be capable of

accommodating the required service vehicles. The relevant Local Authority should always be consulted where the use of skip containers and waste compaction systems are being considered.

Part 5: Waste Storage Points

5.1 Introduction

Waste is typically taken from its point of generation to a temporary storage point outside the building. From here it is then moved to a point for collection. In developments of flats and apartments waste is typically taken from the point of generation straight to the point of collection.

In all cases, collection points should be convenient for the user to access and for service crews to access without presenting a risk to health and safety. For developments of flats and apartments the developer should make adequate arrangements for the management and maintenance of all communal waste transit and storage infrastructure. The developer should demonstrate these arrangements to the satisfaction of the Local Planning Authority.

5.2 Underground Storage of Waste

As an alternative, developers are encouraged to consider underground storage of waste. Such systems may be particularly suitable for use within multi-occupancy residential developments.

The use of underground storage systems for bring sites may also be suitable (discussed under Part 9) and indeed, it may be possible to combine systems to provide specific development needs and serve the wider community as a bring site. Such proposals will require careful evaluation in conjunction with the relevant Local Authority.

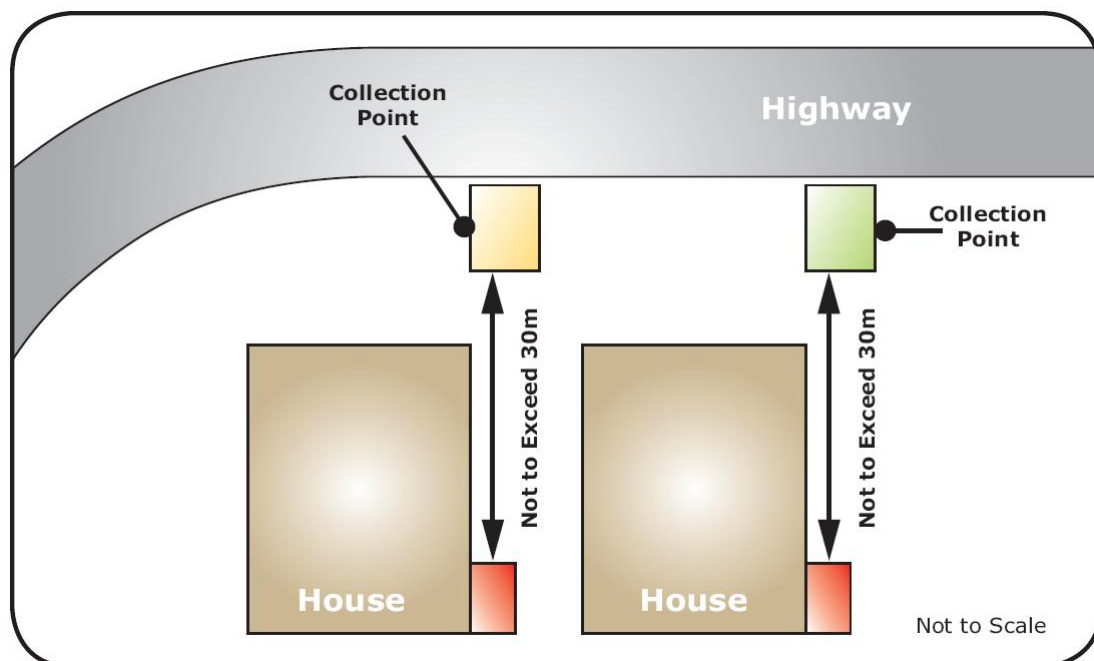
5.3 Residential Storage Points

5.3.1 Single Houses

For single houses wherever possible, and when stored within the boundaries of the property, waste containers should:

- Be housed within a designated area or structure as appropriate;
- Be easily accessible to the occupier;
- Not have to be moved through a building to the collection point;
- Be located in a shaded position and away from windows; and
- Be located in a well ventilated area.

Figure 1: Movement Distances for Waste Containers - Single Houses.

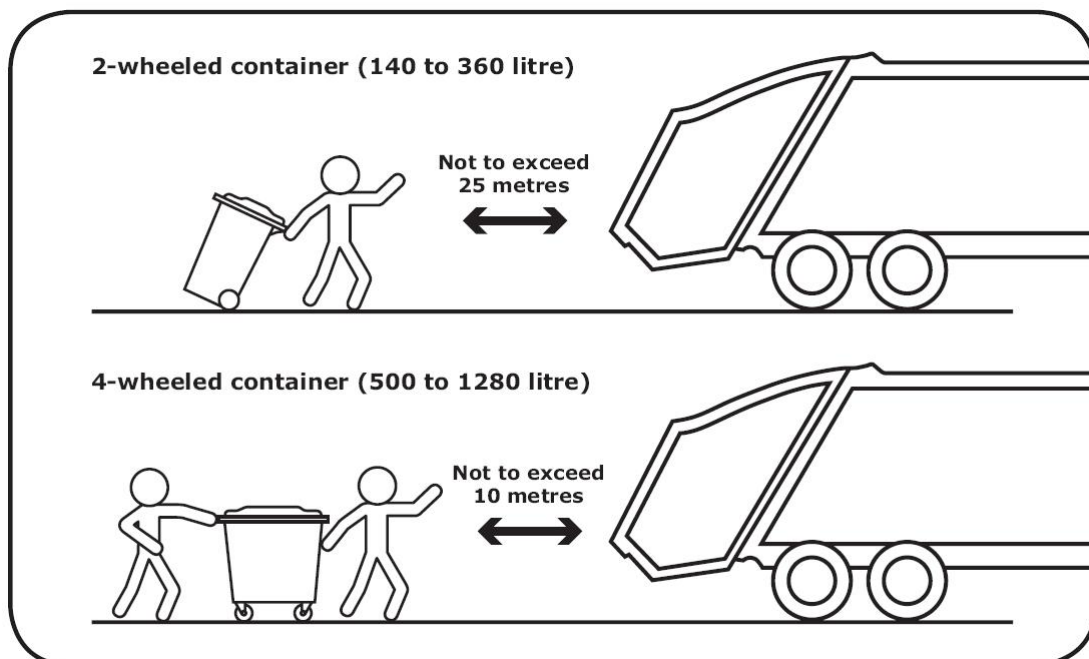


In terms of distances and gradients, the following should be observed:

- Residents should not have to move waste more than 30m to any designated storage area within the boundaries of the property;

- Any designated storage area within the boundaries of the property should not be more than 30m distance from the collection point;
- Collection crews should not have carry individual waste containers or move wheeled containers more than 25m (see top illustration within Figure 2);
- Passage of a wheeled container should avoid steps, but where not possible should avoid transfer over more than 3 steps; and
- In all cases, gradients should not exceed 1:12.

Figure 2: Container Movement Distances for Collection Crews.



5.3.2 Flats/Apartments - Options

For flats/apartments, temporary storage of waste is unlikely to occur immediately outside each flat/ apartment. Waste is normally transferred straight to the point of collection which comprises a communal storage facility (be that above or below ground).

A number of transit options are typically available and are illustrated in the table below.

Table 8: Potential Options for the Transit of Waste to Communal Storage Facility (Flats/Apartments)

Option	Description
Resident Transit	In low-rise blocks (up to 4 floors) it is typical for residents to transfer their waste to communal compounds, within which are located a number of bins to receive the waste. Residents should not have to transfer waste more than 30m (excluding vertical distance). Best practice is to install bins allowing the segregation of material types from residual waste. Waste compounds should form a designated structure and their design is covered in Part 6.
Chutes	In high-rise blocks (above 4 floors) waste chutes are a potential option for installation for the deposit of waste. The chute system then conveys the waste (by gravity) to a point of storage. This may be a compactor, a skip or large bin. Specifications for refuse chutes are detailed in BS1703.
Facilities Management Complete Collection Service	Residents deposit their waste, in bags, outside their door from where it is collected by a management team.

	Service lifts should be installed.
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In addition to the above, where it is necessary for collection crews to move bins from the communal storage facility to tip into the collection vehicle, they should not have to move large containers (4 wheels) a distance exceeding 10m (see bottom illustration in Figure 2). Option choice, and therefore the waste transit method open to residents should be assessed against:

- User convenience and efficiency;
- Health, safety and security; and
- Risk of environmental harm.

The challenging issues posed by flats and apartments (particularly those of a high-rise nature) are further addressed under An Integrated Approach To Waste Management In Flats And Apartments.

Waste storage arrangements at commercial premises need to reflect these stringent demands and should allow additional space and infrastructure for the separate storage of these waste types.

5.4 Commercial Storage Points

The Landfill Directive requires commercial waste to be pre-treated i.e. recycled rather than disposed of at landfill sites. For commercial developments the same criteria as outlined above for flats and apartments should be used when assessing waste storage location options. In addition evaluation against the anticipated nature of the activities (waste volume, waste types, storage methods and capacity, size and type of waste container, segregation requirement and collection frequency) should also be made.

Collection crews should not have to move large containers (4 wheels) a distance greater than 10m.

5.5 Collection Frequency

Current collection frequencies by each of the RECAP Authorities are detailed at Appendix C. As these are subject to change required please contact the relevant Waste Collection Authority for the latest information.

Part 6: Waste Storage Infrastructure

6.1 Introduction

Where waste is collected on a communal or commercial basis it is good practice to construct a storage compound to house the waste containers. Any such compounds must be functional allowing ease of use by those resident/working at the property and those serving it.

Where waste storage compounds are to be utilised the developer should make adequate arrangements for their management and maintenance to the satisfaction of the Local Planning Authority.

Though the information contained in this part is particularly applicable to the creation of communal waste storage compounds at residential developments of flats and apartments and commercial developments, the general principles can be applied to the creation of areas for housing waste receptacles at single houses - those general principles being:

1. Adequate space for function;
2. Use of suitable building materials;
3. Health and Safety;
4. Security; and
5. Environmental protection

6.2 Minimum Specifications for Waste Storage Systems

6.2.1 Above-ground Storage Compounds

The size of any given enclosure will be dependent on waste generation, container size to be used and collection service provided. However, the following minimum specifications should be adhered to when designing waste storage compounds:

- Sufficient clearance provided to allow full opening of the container lid;
- 150mm clear space between and around containers;
- Minimum working headroom of at least 2m (where compound is covered);
and
- Layout such that any one receptacle can be serviced without having to move any other receptacle.

At its most basic, a waste storage compound may comprise a slatted fence surround with gate over an impervious floor with suitable drainage (open-air compound). At the opposite end of the scale, a storage compound may comprise an enclosed structure (enclosed compound).

6.2.2 Underground Storage Systems

Sizing of underground storage systems will be determined by likely waste generation and the availability of useable space – i.e. free from services below ground and clear space above to allow emptying of containers. The latter point is of particular importance as underground storage systems will typically be serviced by special vehicles fitted with crane arms to lift the underground units out of the ground and above the vehicle for emptying.

Given the above, the evaluation and development of underground systems must take place in consultation with the relevant Local Authority.

6.3 Assessment of Storage System Type and Location

For flats and apartments and commercial developments, the method of waste storage and its location must be assessed against the criteria as detailed under Assessment Criteria. This is a fundamental requirement and evidence of such an assessment must be submitted with planning applications.

6.4 Construction of Storage Systems

6.4.1 Above-ground Storage Compounds

Specific construction requirements are addressed at Appendix D but, in general, it must be clearly demonstrated that:

- Permanent ventilation has been provided at the top and bottom;
- An impervious floor has been provided;
- Walls are constructed of/lined with, a hard impervious material suitable for washing down; and
- Adequate drainage has been provided.

In addition, it is preferable that storage areas are covered.

6.4.2 Underground Storage Systems

Typically such units consist of a pre-fabricated concrete casing into which fits a large steel container. This is all concealed beneath a flat-walk platform onto Construction and installation specifications are detailed at Appendix G but exact requirements must be discussed with the relevant Local Authority.

6.5 Additional Storage Areas

For managed high density multi-occupancy residential developments it is recommended that additional storage space should be provided for bulky household items.

Part 7: Waste Collection

7.1 Introduction

Waste collection is a statutory service – without this provision, public health issues arise. Developers and designers must remember this and make appropriate provision.

An essential tool for designers and developers when addressing the wider issue of highways development is the Cambridgeshire Design Guide for Streets and Public Realm.

7.2 Key Aspects of Highway Design

Contemporary urban design is shifting away from the dominance of places by roads. However, the basic principles running through the changing approach to highways clearly value the importance of vehicle access. Routes should:

- Interlink with each other;
- Make direct connections between developed facilities;
- Connect to existing routes and facilities;
- Facilitate traffic management; and
- Offer convenience to users.

Typical specifications for a waste collection vehicle are detailed in Part 7.3 below and are intended as a guide only. With change in mind, the passage of a large waste collection vehicle may not offer the best solution for a particular development. In such cases, opportunities for innovation exist and the Local Authorities of the RECAP Partnership welcome alternative waste collection ideas.

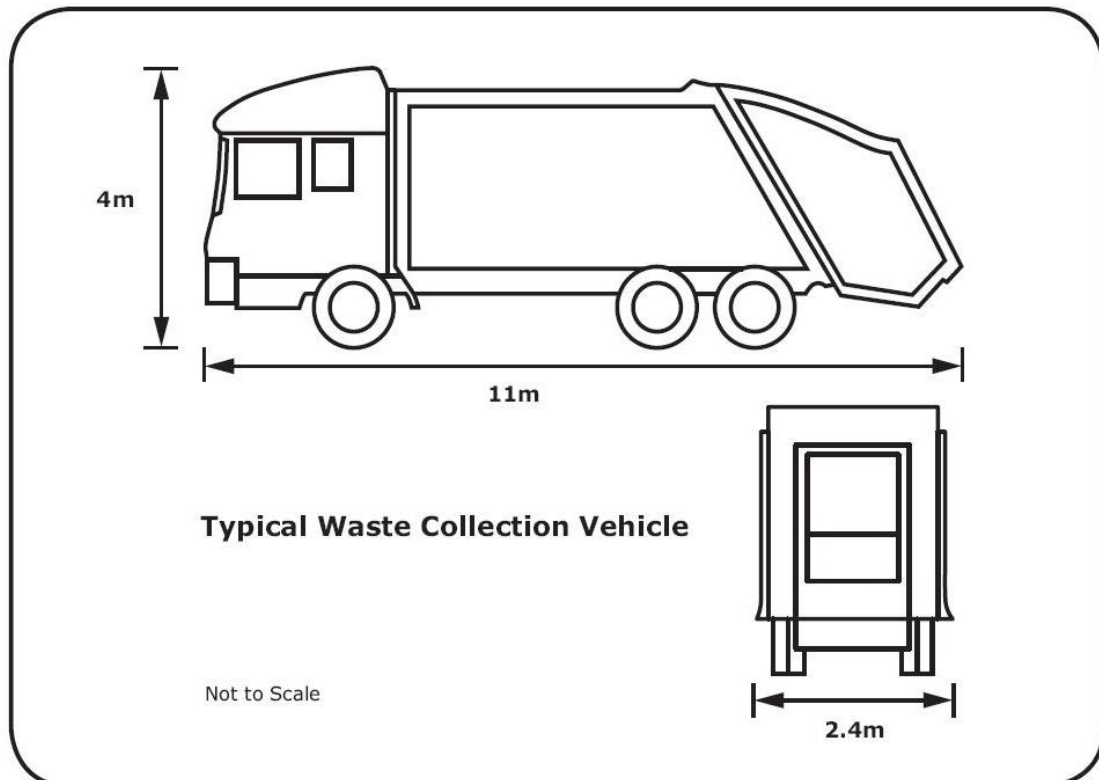
7.3 Waste Collection Vehicle Specifications

A typical waste collection vehicle has the following specifications:

- 26 tonnes gross vehicle weight (GVW);
- Length of 11m;
- Width of 2.4m;
- Operating height of 4m; and
- Wall to wall turning circle of 21.9m.

Clear space around the vehicle should be sufficient to allow efficient operation. For example, a minimum working area of 3.5m width and 4m in length should be sufficient where the emptying of containers takes place.

Figure 3: Typical Waste Collection Vehicle Dimensions.



7.4 Highway Design

7.4.1 Construction

When constructing highways, reference should be made to:

- Manual for Streets (Department of Transport); and
- Design Manual for Roads and Bridges (Highways Agency).

In general terms the foundations and surfaces of any highway should be hardwearing and capable of withstanding the maximum anticipated fully loaded gross vehicle weight. Any covers over manholes and gully gratings (and other such infrastructure) should also be formed from materials capable of withstanding such weight.

7.4.2 Tracking

While BS5906:2005 requires a minimum of 5 metres street width for waste vehicles, there may be instances where a lesser width may be appropriate providing vehicle tracking is undertaken and it can be demonstrated to the satisfaction of the Local Planning Authority that the waste collection vehicle to be employed can pass through narrower street widths. Where a development is to be served by a Local Authority waste collection this clearly means being capable of accommodating a vehicle with typical dimensions as described above.

Tracking:

- Has the arrangement of buildings as its starting point;
- Uses footway layouts to reinforce the arrangement of buildings;
- Allows a road to flow through a development without becoming the dominant feature.

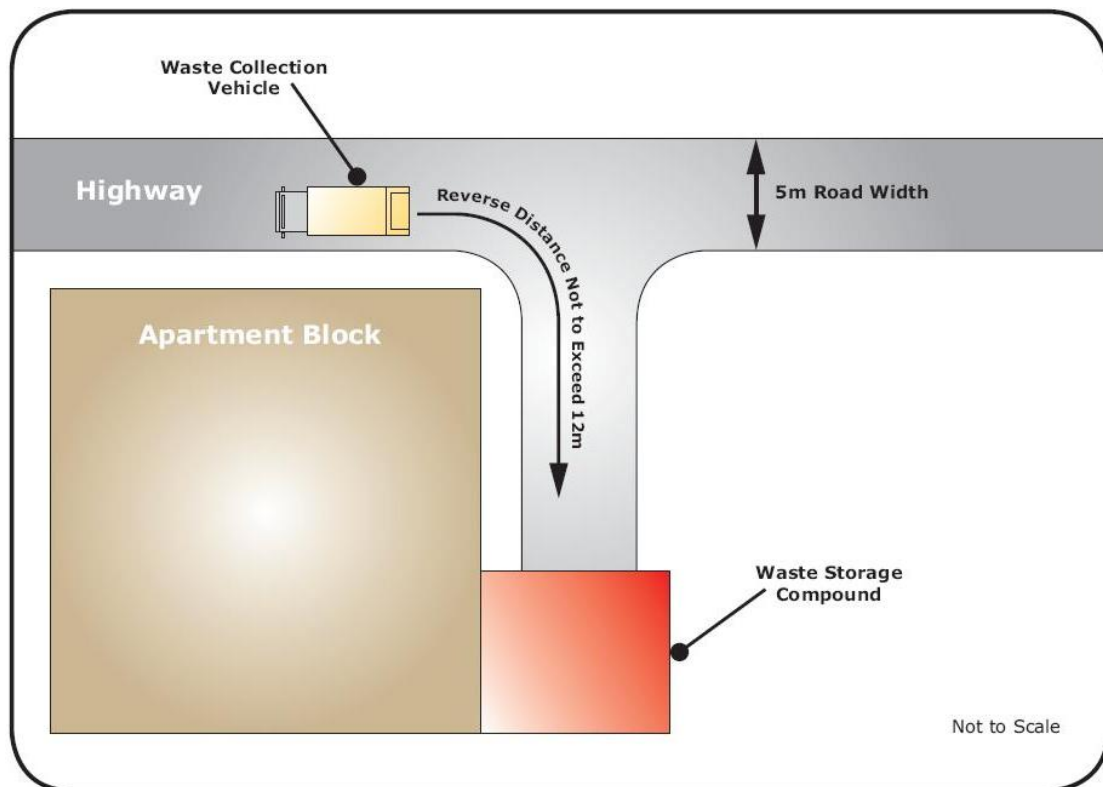
As such, the appropriateness for function of carriageway width is checked by plotting vehicle tracking paths. An illustration of design by tracking is presented at Appendix F.

7.4.3 Routing

BS5906:2005 states that routes should permit collection vehicles to continue mainly in a forward direction and should not require vehicles to reverse more than 12m. Where this distance is exceeded turning heads will be provided in accordance with the principles of tracking as considered above.

The basic principles of highway design outlined above (those of interlinking and direct connections) are well capable of satisfying these requirements. The key is to design building locations with servicing in mind – the ultimate aim being to allow a smooth service passage without excessive reversing and the need to double-back and turn full circle.

Figure 4: Reversing Distance for Waste Collection Vehicles.



7.5 Commencement of Collection Service

Local Authority waste collection will not commence until road surfaces are complete to base layer and access is unhindered by ongoing construction work and materials delivery. Where this is not the case and a development requires a waste collection service, provision may have to be made by the developer at their cost.

7.6 Alternative Methods of Collection

Where passage through a completed development is inconsistent with the existing Local Authority waste collection arrangement, a developer must ensure adequate waste collection provision is made. It is recognised that, by design, this may be the case and that given the character of some streets it would be impractical to utilise existing Local Authority waste collection methods. It is therefore important that timely consultation is undertaken with the Local Authority concerned for the consideration of alternative arrangements and any cost implications that may require developer funding.

It should be noted that Waste Collection Authorities within the area will fund schemes up to a maximum amount (based on a calculated cost of providing waste collection services for individual households). Beyond this amount, a developer will have to provide the rest of the funding.

Part 8: Household Recycling Centres

8.1 Introduction

A network of Household Recycling Centres are provided by Cambridgeshire County Council and Peterborough City Council (responsible as Waste Disposal Authorities). The sites are positioned in strategic locations and enable the public to bring and deposit bulky household wastes and other waste types of household waste that are not normally taken as part of the normal collection round. Sites encourage the segregation of waste for recycling and reuse.

In Cambridgeshire and Peterborough facilities are available for materials such as: bulky household wastes, timber, garden wastes, waste electrical equipment (such as televisions, computers and batteries), car batteries, engine oil, vegetable oil, paint, fluorescent tubes, hardcore and soil, scrap metal and textiles, glass, cans, plastics, paper and card.

8.2 Current Infrastructure

As required by the Refuse Disposal (Amenity) Act 1978, each Local Authority must provide sites for the reception of excess household and garden waste free of charge. It follows that provision should be sufficient for the needs of the locality. Cambridgeshire County Council currently operate 9 Household Recycling Centres and Peterborough City Council operate 1.

Continued development in the area will require development of the network through the provision of further or expanded infrastructure as set out below.

8.3 Contribution to Waste Management

Of the waste received at the Household Recycling Centres during 2006 – 2007, 55% (Cambridgeshire County Council) and 49% (Peterborough City Council) was recycled.

Across Cambridgeshire and Peterborough, the development of Household Recycling Centres represents a success and has contributed to the county being ranked the highest recycling county in the UK for the past years.

8.4 Future Provision of Household Recycling Centres

To adequately serve the growing population of the area, the existing network of sites is to be upgraded by making improvements, relocating sites and constructing new sites between now and 2026.

Allocations for future Household Recycling Centres have been made in the Cambridgeshire and Peterborough Minerals and Core Strategy Waste Strategy at the following locations Cambridge East, Cambridge North, Cambridge South, Northstowe, March and Peterborough.

Developers will not be expected to construct Household Recycling Centres, however they will be expected to contribute reasonable finances in accordance with Circular 05/05 proportionate to their development or as required as part of the Community Infrastructure Levy (where waste management infrastructure is included). At strategic locations Developers will be required to provide land. Of primary consideration will be:

- Finance for upgrading existing Household Recycling Centres – contributions from developers will be calculated on a per dwelling basis;
- Finance for new Household Recycling Centres – contribution from developers will be calculated on a per dwelling basis; and
- Making land available for strategically located Household Recycling Centres

Section 106 Agreements or other suitable legal agreements, will be used to secure contributions and ensure that adequate infrastructure exists. Reference should be made to Basis for Conditions and Agreements which detail potential conditions and agreements that a developer may, in discussion with the Local Planning Authority, be legally obligated to satisfy. Such issues must be discussed with the relevant Waste Disposal Authority at the earliest possible opportunity.

Part 9: Bring Sites

9.1 Introduction

Bring sites are an essential element of the RECAP waste strategy, extending resident choice by providing additional recycling opportunities for a range of materials, not all of which are collected by existing kerbside recycling services provided by individual waste collection authorities.

They are generally located within publicly accessible areas such as a supermarket or public car park and typically comprise a number of containers allowing separate collection of materials for recycling. They are serviced by or on behalf of individual Waste Collection Authorities.

9.2 Current Infrastructure

There are currently 380 Bring Sites operating within the RECAP area collecting a range of materials for recycling (Source: Atkins, 2007). Site densities typically vary between 1 per 500 households and 1 per 2000 households. (Source: Aylesford Newsprint, 2004)

In 2006/07 Bring Sites contributed approximately 3% to the overall RECAP recycling rate of 47% and have contributed to the RECAP area being historically the highest recycling area in the country.

9.3 Provision of Bring Sites in Future Developments

This Guide seeks to ensure that adequate temporary and permanent bring site facilities are provided to serve new developments.

Developers should assess the impact of their proposals on existing bring site facilities and in particular whether the development creates or increases the need for such facilities in the local area. This should be done through, for example, a waste audit or waste management plan.

Developers may be required to provide additional bring site facilities, upgrade existing facilities in the locality, in accordance with Circular 05/05 or as required as part of the Community Infrastructure Levy (where waste management infrastructure is included), pay a reasonable financial contribution to the relevant local authority for provision or upgrade. Developers should discuss these issues with the Local Planning Authority and Waste Collection Authority at the earliest opportunity prior to submitting their planning application and reference should be made to Basis for Conditions and Agreements which details potential conditions and agreements that may be applied by a Local Planning Authority through, for example, Section 106 Agreements.

For new developments Local Planning Authorities will seek to achieve a maximum density of one Bring Site facility per 800 households, the first facility being operational on occupation of the 800th property. Temporary facilities should also be provided during the construction phase on occupation of the 50th property until each permanent facility is operational. However, in both cases, variation from the maximum recommended densities may be considered where a developer can demonstrate to the satisfaction of the Local Planning Authority (such as through a waste audit) that the needs of the occupiers of the development are adequately met.

9.4 Location of Bring Sites

Temporary and permanent bring site facilities should be suitably located so as to be easily and conveniently accessible to site users within the communities that they serve, but should be at least 20m distance from the nearest dwelling to reduce disturbance to residents. In terms of servicing, Bring Sites must be accessible to service vehicles by adoptable highways, and situated so as to avoid damage to overhead services during collection. Location of facilities must be identified to the Local Planning Authority.

9.5 Management and Maintenance

The developer should make adequate arrangements for the management and maintenance of all temporary facilities. The developer should demonstrate to the satisfaction of the Local Planning Authority that adequate arrangements are in place for the future management and maintenance of all permanent facilities (see Basis for Conditions and Agreements).

9.6 Underground Bring Sites

When considering the provision of permanent Bring Sites, consideration should be given to the provision of underground recycling bank facilities. These have small posting units above ground and have the advantage over traditional banks of reduced visual impact and of enabling access by those with restricted mobility.

A seven-container underground recycling bank facility will typically occupy a site area of between 40 – 50 square metres, excluding roadways. The precise number, capacity and nature of the containers required should be identified by the developer as part of the assessment of the waste impact of their development and through discussions with the Local Planning Authority and Waste Collection Authority.

An indicative generic specification of an underground Bring Site facility is attached as Appendix G.

Part 10: Educational Schemes and Additional Options

A number of additional options that a developer may wish to consider in order to provide an effective system of waste management within their development are suggested below. They represent options that may assist in establishing effective and sustainable methods of waste management.

10.1 Education Schemes

RECAP are actively seeking to engage developers in schemes of education to promote the aims of effective waste reduction and recycling especially where alternative waste collection systems are to be employed. It should be recognised that a developers marketing strategy can be enhanced by developing education schemes in partnership with RECAP. An example could be developers providing waste information in a home starter pack.

Local Authorities in the RECAP Partnership run a wide range of education and awareness initiatives all year round to encourage residents to minimise waste and recycle more. RECAP has experience in developing educational materials, as well as implementing recycling awareness campaigns. National recognition has been given to the RECAP Partnership for their success in engaging with residents and community organisations, as all RECAP partners were awarded Beacon Council Status in the category of waste and recycling.

RECAP has dedicated officers in all partner authorities who are able to provide advice on engaging local communities to encourage sustainable waste management. RECAP also runs an active programme of waste awareness campaigns. Cambridgeshire County Council run two 'Recycling Buses' which assist in delivering the environmental messages to school children and community groups across Cambridgeshire.

10.2 Additional Waste Treatment Options

10.2.1 Composters and Wormeries

Composting is the process of producing compost through aerobic decomposition of biodegradable organic matter. All of the Local Authorities in the RECAP Partnership collect waste for composting on a large scale, but home composting is to be encouraged. To this end, developers should evaluate the potential for providing compost bins to individual dwellings as appropriate, offering the immediate opportunity for householders to actively partake in waste reduction.

Typically, home composting is achieved passively (such as through piling or containing suitable wastes and leaving them to decompose). However, more active methods include vermicomposting (worm composting); compostable waste is added to a container filled with moistened bedding and redworms which, along with micro-organisms, eventually turn the waste into a rich compost.

10.3 Community Schemes

10.3.1 Cambridgeshire Community Reuse and Recycling Network (CCORRN)

CCORRN (www.ccorrn.org.uk) is a network between the community, public and private sector and was started in 2003. Financial support was awarded to Cambridgeshire County Council for its establishment, from DEFRA's Recycling Challenge Fund and Enventure.

CCORRN's goal when incepted was to successfully increase the quantity of community reuse and recycling projects in the County. The network aims to:

- Share knowledge and skills and disseminate best practice;
- Assist projects in accessing funding to secure long-term viability;

- Build and strengthen partnerships between all those interested;
- Provide regular easy access to information;
- Work with other parties on wider joint projects; and
- Raise awareness and the profile of the network.

10.3.2 Community Recycling Network

The Community Recycling Network UK (www.crn.org.uk) is the national umbrella organisation for community-based, not-for-profit and co-operative waste management groups which work in reduction, re-use and recycling.

CRN helps its members by:

- co-ordinating networks for groups to share information and ideas;
- organising events to bring people together;
- offering advice for members to develop operations and infrastructure;
- lobbying decision-makers; and
- providing advice, training, information and support.

10.3.3 Groundwork

Groundwork (www.groundwork.org.uk) supports communities in need, working with partners to help improve the quality of people's lives, their prospects and potential and the places where they live, work and play.

Groundwork East of England covers 6 counties: Essex, Hertfordshire, Bedfordshire, Cambridgeshire, Norfolk and Suffolk. The regional office is based within the Forest Centre, in the heart of the Forest of Marston Vale, Bedfordshire, with staff working alongside the established Community Forest team.

Though, at present, there are no notable waste related projects operational in the Cambridgeshire area Groundwork East Lancashire supported the development of Offshoots, a community scheme collecting catering waste from households for composting.

10.4 Recycling Networks

10.4.1 RECAP Swap and Sell Scheme

RECAP hosts a swap and sell service on its website (www.recap.co.uk). It is a free online exchange service where the public can access details about unwanted or surplus items and view requests for wanted goods. It's main aim is to help users get rid of unwanted items or to enable users to find goods that others no longer need.

10.4.2 Freecycle UK

The UK Freecycle Network (www.ukfreecycle.org) is made up of many individual groups across the globe. Freecycle groups match people who have things they want to get rid of with people who can use them.

Toolkit: RECAP Waste Management Design Guide

Toolkit

HOW TO USE THE TOOLKIT

The TOOLKIT will allow effective evaluation of the waste management requirements for a development.

Components

The Toolkit is made up of 3 tools as described below. The tools are interlinked and refer to each other as appropriate.

Toolkit Components			
Design Standards Checklist	Standards	Assessment Criteria	Basis for Conditions and Agreements
Developers will be expected to demonstrate that their proposals satisfy the requirements of this Guide by assessing their proposals against the expected standards which are brought together under the Design Standards Checklist.		Depending upon development proposals, it may be that a developer is required to conduct a wider assessment of the impact of their scheme (or aspects thereof). Criteria for such an assessment are presented under the Assessment Criteria.	For some developments it may be appropriate to apply planning conditions or negotiate S106 agreements relating to several factors as detailed under the Basis for Conditions and Agreements.

Applicability And Use

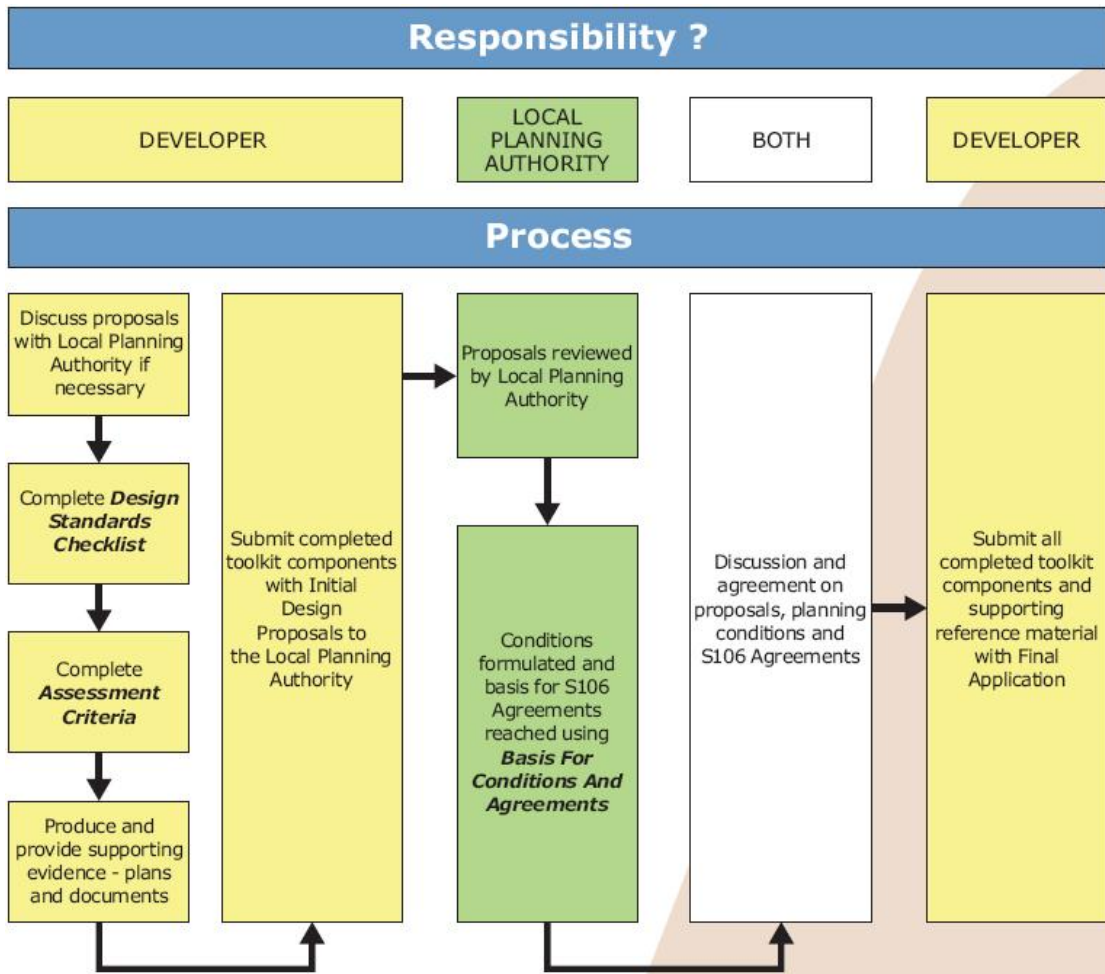
Design Standards Checklist	Applies to all developments. To be used and completed by the developer and supported by plans and/or
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	documents as appropriate.
Assessment Criteria	To be completed by the developer where proposals involve: the construction of waste storage compound(s); and/or installation of Bring Site infrastructure; and/or alternative schemes.
Basis For Conditions And Agreements	To be utilised by the Local Planning Authority as appropriate in relation to: the provision of waste storage containers; the Recycling Centre network; and the Bring Site network.

Where appropriate, the Toolkit will supplement a waste audit.

Process

The diagram on the following page illustrates the process for completing the Toolkit and shows responsibilities.



DESIGN STANDARDS CHECKLIST

Instructions

Usage

To be completed by the developer and submitted to the Local Planning Authority with all supporting plans and/or documents.

The DESIGN STANDARDS CHECKLIST applies to **all** developments of a residential, commercial or mixed residential/commercial nature regardless of scale.

Completion

Completion involves 2 distinct steps:

Step 1	This is the standard required. Developers should ensure that they are aware of the minimum expectations the Design Guide places upon them. A tick should be placed in the adjacent box to signify that an issue has been considered at the stage of initial design proposals. Where a standard is not met, the developer must state why.
Step 2	Evidence of design specifications/details should be provided to the Local Authority with reference to the necessary relevant plans and/or documents made in the final box.

Note: Consultation with the Local Authority is encouraged, particularly where proposals relate to large scale development.

Submission

The completed DESIGN STANDARDS CHECKLIST must be submitted with all initial design proposals and will be reviewed by the Local Planning Authority.

The DESIGN STANDARDS CHECKLIST will then be submitted with all final development applications following any discussion with the Local Planning Authority and necessary amendments.

DESIGN STANDARDS CHECKLIST

	STEP 1		STEP 2
Key Consideration	Aware Of Standard Minimum Expectations?	Does This Apply to You? ✓ or ✗	Submit Proposals To Planning Authority (Provide Plan/document Reference)
Residential - Internal Storage Requirement Refer to Part 4.2 of the Design Guide.	35 – 40 litres for single dwellings and multi-occupancy developments (low-rise and high-rise) permitting segregation of waste as appropriate. Typical container specifications are detailed at Appendix A.		

Residential - External Storage Requirement Refer to Part 4.2 of the Design Guide.	Single Dwelling - Space for containers allowing 775 litres of capacity must be provided. Typical container specifications are detailed at Appendix A. Provision of containers and/or financial contributions towards may also be required.		
	Low-rise with communal gardens - Space for containers allowing between 320 and 720 litres of capacity per unit (depending on room number) must be provided. Typical container specifications are detailed at Appendix A. Provision of containers and/or financial contributions towards may also be required.		
	Low-rise without communal gardens - Space for containers allowing between 240 and 640 litres of capacity per unit (depending on room number) must be provided. Typical container specifications are detailed at Appendix A. Provision of containers and/or financial contributions towards may also be required.		

	<p>High-rise - Space for containers allowing between 240 and 640 litres of capacity per unit (depending on room number) must be provided. Typical container specifications are detailed at Appendix A. Provision of containers and/or financial contributions towards may also be required.</p>		
<p>Commercial - Storage Requirements</p> <p>Refer to Part 4.3 of the Design Guide.</p>	<p>Offices - 2600 litres per 1000m gross floor area. Typical container specifications detailed at Appendix A.</p>		
	<p>Retail - 5000 litres per 1000m gross floor area. Typical container specifications detailed at Appendix A.</p>		
	<p>Restaurants/Fast Food Outlets - 1500 litres per 20 dining spaces. Typical container specifications detailed at Appendix A.</p>		
	<p>Hotels - 5000 litres per 20 dining spaces. Typical container specifications detailed at Appendix A.</p>		
<p>Waste Storage Point - Single Houses Refer to Part 5.3 of the Design</p>	<ul style="list-style-type: none"> • Waste should not have to be moved more than 30m to storage area; • Storage location should not be more than 30m distance from the collection point; collection crews should not have to carry individual waste containers or move 2-wheel 		

<p>Guide.</p>	<p>containers more than 25m. • Passage of a 240l wheelie-bin from store to collection point should avoid steps, but where not possible should avoid transfer over more than 3 steps. • Gradients over which containers must traverse should not exceed 1:12. • Not have to be moved through a building to the collection point.</p>		
<p>Waste Storage Point – Flats and Apartments and Commercial Developments Refer to Parts 5.3 and 5.4 of the Design Guide.</p>	<p>• Waste should not have to be moved more than 30m (excluding vertical distance) to storage area; • Storage location should not be more than 10m distance from the collection point; • Passage of waste containers from store to collection point should avoid steps, but where not possible should avoid transfer over more than 3 steps. • Gradients over which containers must traverse should not exceed 1:12</p>		
<p>Waste Storage Infrastructure Refer to Part 6 of the Design Guide.</p>	<p>Where infrastructure is installed for the communal storage of waste a SIMPLE assessment of the location and proposed infrastructure must be made against the key factors as specified in the accompanying Assessment Criteria. The size of any storage area should be capable of accommodating the required number of waste receptacles (and their associated dimensions) or provide</p>		

	<p>adequate capacity. General design features for above-ground storage compounds:</p> <ul style="list-style-type: none"> • Sufficient clearance provided to allow full opening of the container lid; • 150mm clear space between and around containers; • Minimum working headroom of at least 2m (where compound is covered); and • Layout such that any one receptacle can be serviced without having to move any other receptacle. <p>Specific design requirements are detailed at Appendix D and should be referred to. Underground storage systems require:</p> <ul style="list-style-type: none"> • Area(s) of ground free from services; and • Sufficient clear space above and around to allow emptying of containers. <p>An indicative generic specification of an underground Bring Site facility is attached as Appendix G.</p>		
<p>Highways Refer to Part 7.4 of the Design Guide.</p>	<p>Where development proposals will seek to utilise a standard service as provided by the Waste Collection Authority, highways should:</p> <ul style="list-style-type: none"> • Have a minimum width of 5m; • Permit collection vehicles to continue mainly in a forward direction; • Not require vehicles to reverse more than 12m; • Be constructed in accordance with relevant guidance; and • Allow at least 4m vertical 		

	<p>clearance. In addition a minimum working area of 3.5m width and 4m in length should be allowed where the emptying of containers takes place. Sufficient overhead clearance should also be provided to allow for operation.</p>		
<p>Household Recycling Centre Requirement Refer to Part 8.4 of the Design Guide.</p>	<p>Where appropriate, developers will be expected to: • Provide finance for upgrading existing Household Recycling Centres; or • Provide finance for new Household Recycling Centres; and/or • Make land available for strategically located Household Recycling Centres Section 106 Agreements or other suitable legal agreements, will be used to secure contributions/land and ensure that adequate provision is made.</p>		
<p>Bring Site Requirement Refer to Part 9.3 and 9.4 of the Design Guide.</p>	<p>Where appropriate, to ensure provision of 1 bring site per 800 households, developers may be required to: • Finance and/or provision of infrastructure for new sites; or • Provide finance for upgrading existing facilities. Developers will also need to provide temporary facilities by occupation of the 50th property. Both temporary and permanent Bring Site facilities should be located at least 20m distance from the nearest property,</p>		

	<p>accessible by service vehicles and located so as to avoid damage to overhead services during servicing. Section 106 Agreements or other suitable legal agreements, will be used to secure contributions and ensure that adequate provision is made. A SIMPLE assessment of the location and proposed infrastructure must be made against the key factors as specified in the accompanying Assessment Criteria.</p>		
<p>Alternative Waste Management Schemes Refer to Part 1.4 of the Design Guide.</p>	<p>A DETAILED assessment of the scheme must be made against the key factors as specified in the accompanying Assessment Criteria. A developer will be required to fund such schemes beyond the amount the Local Authority would otherwise pay for standard service and pay for and provide non-standard infrastructure.</p>		

ASSESSMENT CRITERIA

Instructions

Usage

To be completed by the developer and submitted to the Local Planning Authority with all supporting plans and/or documents.

The assessment criteria tool only has to be used where development proposals involve:

- Construction of a waste storage compound; and/or
- Installation of Bring Site infrastructure; and/or
- An alternative scheme.

However, where the ASSESSMENT CRITERIA TOOL would otherwise not apply, a developer may still wish to voluntarily assess the waste management aspects of their development proposal against several or all of the key factors.

Completion

Completion of the ASSESSMENT CRITERIA TOOL should be as follows:

Waste Storage Complete Sheet A.	Provide a SIMPLE Compound assessment
Installation of Bring Site Infrastructure	Complete Sheet B. Provide a SIMPLE assessment. Discussion with Local Planning Authority required for issues of accessibility and health and safety.
Alternative Scheme	Complete Sheet C. Provide a detailed assessment. Consultation with Local Planning Authority mandatory for all

	issues.
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SIMPLE Assessments – adequate amount of information to demonstrate suitability of proposals required.

DETAILED Assessments – detailed information must be provided to demonstrate the suitability of proposals.

ASSESSMENT CRITERIA

SHEET A: WASTE STORAGE COMPOUND

Assessment Factor	Information Required – Simple Assessment	Submit Assessment to Planning Authority (Provide Document Reference)
Quality Place Making	Design should also be assessed for consistency with the wider development framework and the promotion of quality place making.	
Proposals for On-site Treatment	On-site treatment (e.g. bailing, compaction or other treatment that may be utilised in an alternative scheme) may be beneficial on larger sites. In such cases, a clear illustration must be provided of (where appropriate): <ul style="list-style-type: none"> • Sustainability of treatment methods; • Waste volume reduction; • Beneficial use of waste (recovery of value, energy, etc); • Implications for Waste Collection Authority and Waste Disposal Authority. 	

Accessibility	Depending upon the waste infrastructure employed, it must be demonstrated that: <ul style="list-style-type: none"> • The location chosen offers convenience and efficiency for all users; • An assessment of potential user conflict has been made with appropriate solutions provided; and • Marking and signage is adequate for function. 	
Health and Safety	All proposals must be accompanied by a health and safety risk assessment and account must be made of (where appropriate): <ul style="list-style-type: none"> • Lighting; • Steps and gradients; • Marking and signage; • User conflicts; • Risks from equipment/technology utilised; • Training requirements (operators); 	
Security	It must be clearly demonstrated that proposals: <ul style="list-style-type: none"> • Will not jeopardise the security of the wider area; and • Infrastructure will, as appropriate, feature security measures that permit efficient user operation but are robust enough to deter vandalism, arson and other forms of misuse. Notes on waste compound security are presented at Appendix E. 	
Protection of the Environment	Assessment must be made of the impact proposals may have in terms of: <ul style="list-style-type: none"> • Nuisance and amenity (including visual impact); and • Pollution threat to environmental media (i.e. air, land and water). Suitable mitigation measures must be outlined. 	
Maintenance	Where maintenance responsibility lies with the developer they must: <ul style="list-style-type: none"> • Submit proposed maintenance schedules (routine and non-routine); • Submit proposals for maintaining 	

	records of works undertaken; and • Submit details of third party contractors to be employed.	
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For multiple storage points/methods, this table should be copied and completed as appropriate.

SHEET B: PROVISION OF BRING SITE INFRASTRUCTURE

Assessment Factor	Information Required – Simple Assessment	Discussed With Local Authority? ✓ or ✗	Submit Assessment to Planning Authority (Provide Document Reference)
Quality Place Making	Design should also be assessed for consistency with the wider development framework and the promotion of quality place making.		
Proposals for On-site Treatment	On-site treatment (e.g. bailing, compaction or other treatment that may be utilised in an alternative scheme) may be beneficial on larger sites. In such cases, a clear illustration must be provided of (where appropriate): • Sustainability of treatment methods; • Waste volume reduction; • Beneficial use of waste (recovery of value, energy, etc); • Implications for Waste Collection Authority and Waste		

	Disposal Authority.		
Accessibility	Depending upon the waste infrastructure employed, it must be demonstrated that: <ul style="list-style-type: none"> • The location chosen offers convenience and efficiency for all users; • An assessment of potential user conflict has been made with appropriate solutions provided; and • Marking and signage is adequate for function. 	✓	
Health and Safety	All proposals must be accompanied by a health and safety risk assessment and account must be made of (where appropriate): <ul style="list-style-type: none"> • Lighting; • Steps and gradients; • Marking and signage; • User conflicts; • Risks from equipment/technology utilised; • Training requirements (operators); 	✓	
Security	It must be clearly demonstrated that proposals: <ul style="list-style-type: none"> • Will not jeopardise the security of the wider area; and • Infrastructure will, as appropriate, feature security measures that permit efficient user operation but are robust enough to deter vandalism, arson and other forms of misuse. Notes on waste compound 		

	security are presented at Appendix E.		
Protection of the Environment	<p>Assessment must be made of the impact proposals may have in terms of:</p> <ul style="list-style-type: none"> • Nuisance and amenity (including visual impact); and • Pollution threat to environmental media (i.e. air, land and water). Suitable mitigation measures must be outlined. 		
Maintenance	<p>Where maintenance responsibility lies with the developer they must:</p> <ul style="list-style-type: none"> • Submit proposed maintenance schedules (routine and non-routine); • Submit proposals for maintaining records of works undertaken; and • Submit details of third party contractors to be employed. 		

For multiple storage points/methods, this table should be copied and completed as appropriate.

SHEET C: ALTERNATIVE SCHEMES

Assessment Factor	Information Required – Detailed Assessment	Consult Local Authority? ✓	Submit Assessment to Planning Authority (Provide Document Reference)
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Development Density and Scale	A developer must demonstrate that their proposals: <ul style="list-style-type: none"> • Will adequately serve the population density of their development and, if applicable, the wider population; • Allocate sufficient land to allow their proposals to function efficiently; • Provide sufficient capacity to account for anticipated density changes in the short-term. 	✓	
Infrastructure Design	It must be demonstrated that infrastructure employed: <ul style="list-style-type: none"> • Is adequate to execute function; • Is robust and durable; • Is compliant with all relevant standards; and • Avoids unnecessary complexity. 	✓	
Quality Place Making	Design should also be assessed for consistency with the wider development framework and the promotion of quality place making.	✓	
Proposals for On-site Treatment	On-site treatment (e.g. bailing, compaction or other treatment that may be utilised in an alternative scheme) may be beneficial on larger sites. In such cases, a clear illustration must be provided of (where appropriate): <ul style="list-style-type: none"> • Sustainability of treatment methods; • Waste volume reduction; • Beneficial use of waste (recovery of value, energy, etc); • Implications for Waste Collection Authority and Waste 	✓	

	Disposal Authority.		
Accessibility	Depending upon the waste infrastructure employed, it must be demonstrated that: <ul style="list-style-type: none"> • The location chosen offers convenience and efficiency for all users; • An assessment of potential user conflict has been made with appropriate solutions provided; and • Marking and signage is adequate for function. 	✓	
Health and Safety	All proposals must be accompanied by a health and safety risk assessment and account must be made of (where appropriate): <ul style="list-style-type: none"> • Lighting; • Steps and gradients; • Marking and signage; • User conflicts; • Risks from equipment/technology utilised; • Training requirements (operators); 	✓	
Security	It must be clearly demonstrated that proposals: <ul style="list-style-type: none"> • Will not jeopardise the security of the wider area; and • Infrastructure will, as appropriate, feature security measures that permit efficient user operation but are robust enough to deter vandalism, arson and other forms of misuse. 	✓	

Protection of the Environment	Assessment must be made of the impact proposals may have in terms of: <ul style="list-style-type: none"> • Nuisance and amenity (including visual impact); and • Pollution threat to environmental media (i.e. air, land and water). Suitable mitigation measures must be outlined. 	✓	
Maintenance	Where maintenance responsibility lies with the developer they must: <ul style="list-style-type: none"> • Submit proposed maintenance schedules (routine and non-routine); • Submit proposals for maintaining records of works undertaken; and • Submit details of third party contractors to be employed. 	✓	

For multiple storage points/methods, this table should be copied and completed as appropriate

BASIS FOR CONDITIONS AND/OR AGREEMENTS

Instructions On Use

Purpose

To be used by the Local Planning Authority when assessing initial design proposals as submitted by the developer.

It may be appropriate to apply conditions or reach agreement on several factors in relation to the development and this tool is a platform for negotiating suitable solutions to arrangements for:

- Financial Contributions;
- Infrastructure and Land Provision;
- Location Issues; and
- Infrastructure ownership and maintenance.

Informing Developer

Any conditions should be imposed or an agreement negotiated in accordance with standard planning procedures and mechanisms.

BASIS FOR CONDITIONS AND/OR AGREEMENTS

Factor	Basis For Condition or Agreement	Applicable to?		
		Residential Developments	Bring Site	Recycling Centre
Finance	A Finance will be provided by the developer sufficient	✓	N/A	N/A

	to allow for the provision of appropriate waste containers.			
Finance	B Finance will be provided by the developer sufficient to allow the upgrade of facilities or the creation of new facilities.	N/A	✓	✓
Infrastructure	A Provision of appropriate waste containers shall be made by the developer sufficient to meet the needs of the development.	✓	N/A	N/A
Infrastructure	B Infrastructure suitable for the creation of both temporary and permanent facilities (as appropriate) will be provided by and installed by the developer. In the case of temporary facilities, the	N/A	✓	N/A

	<p>developer shall also be responsible for removal of infrastructure at the appropriate time and then developing the land in a manner that is either consistent with its wider development as agreed with the Local Planning Authority or in accordance with Local Planning Authority specifications.</p>			
Land	<p>An area of land/areas of land will be provided by the developer (at no cost to the Local Planning Authority or Waste Planning Authority) sufficient in size to allow the creation of new facilities.</p>	N/A	✓	✓
Location*	<p>Suitable locations shall be provided for the provision of both temporary and/or permanent facilities</p>	N/A	✓	N/A*

	so as to be easily and conveniently accessible to site users and service vehicles. Such locations shall be identified in consultation with the Local Planning Authority.			
Ownership	Land and infrastructure ownership shall be retained by the developer until such time as the developer has demonstrated to the satisfaction of the Local Planning Authority that adequate arrangements governing future ownership are in place.	N/A	✓	N/A
Management & Maintenance	The developer should make adequate arrangements for the management and maintenance of all temporary facilities.	N/A	✓	N/A

	<p>The developer should demonstrate to the satisfaction of the Local Planning Authority that adequate arrangements are in place for the future management and maintenance of all permanent facilities.</p>			
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The location of a Recycling Centre must meet the needs of the Mineral and Waste Local Development Framework and Waste Disposal Authority.

AN INTEGRATED APPROACH TO WASTE MANAGEMENT IN FLATS AND APARTMENTS

Introduction

Today, development types are shifting towards high density across the UK due to constraints on available space. This presents a number of issues to effective waste management for a range of stakeholders – developers, residents and service providers alike.

Three key aspects arise:

- Residents – conveniently accessible facilities;
- Local Authorities – efficiency and cost effectiveness of service;
- Developers – space.

The above aspects should be viewed as opportunities for innovation and creativity and co-operation.

Waste management in high-density developments is a challenging issue and it is therefore of prime importance that users of this Guide are aware that the authorities in the RECAP Partnership welcome the proposal of creative and innovative schemes.

The solution proposed below is a simple fictional scenario from which developers may take useful ideas and develop further in their own designs. This model is not the fundamental solution but a guide for the way forward and importantly highlights the need for an integrated approach.

Example Scenario

Of principle importance to the creation of a successful waste management scheme in a high density development allowing for effective segregation, storage and collection of waste is consultation with the Local Authority. Though encouraging innovation, consultation will allow for realism and an achievable solution.

The Development

The proposed development comprises a 10 storey apartment block (high-rise) of 40 apartments and a 4 storey apartment block (low-rise) of 16 apartments. A breakdown of apartments by size is illustrated in the table below.

Table A: Apartment Sizes

High-rise Apartment Block	Low-rise Apartment Block
10 x 1 room units 10 x 2 room units 10 x 3 room units 10 x 4 room units	4 x 2 room units 8 x 3 room units 8 x 4 room units

The high-rise apartment block has a car park and landscaped areas. The low-rise apartment block has a car park and communal gardens. The development is accessible by 2 main routes within the area.

The Planning Process Regarding Waste

The developer utilised the RECAP Waste Management Design Guide Toolkit which was completed, as appropriate and submitted in its entirety with the proposals. Completion of the Toolkit was done in close consultation with the Local Planning Authority.

Contributions were secured by the council for upgrading the network of Household Recycling Centres in the area and a Section 106 Agreement was utilised to ensure the installation of a Bring Site. It was agreed that the Bring

Site would be adopted by the Local Authority upon completion of the development.

Established Waste Services

After discussions with the Local Authority, the developers have established that the following services will be provided:

- Collection of mixed dry recyclables; and
- Collection of residual waste.

The Waste Collection Authority operates an alternate weekly collection for residual waste and mixed dry recyclables.

In addition, a Community Trust composting scheme is established in the area. They accept green garden waste and are willing to collect fruit and vegetable peelings from households for composting. The trust is supported by the Local Authority who use the compost for their public parks and gardens. The trust also offers a service for the collection of bulky household waste items.

Internal and External Waste Storage

Internal waste containers (i.e. waste receptacles in the kitchen) will be provided by the developer for the high-rise and low-rise block.

This will comprise:

- 1 x 20 litre kitchen caddy for residual waste in each kitchen
- 1 x 20 litre kitchen caddy for mixed dry recyclables in each kitchen
- 1 x 10 litre caddy with compostable liner for each kitchen provided by the Community Trust.

External waste capacity will be as detailed in the table below. Finance towards the provision of waste containers has been secured through a Section 106 Agreement.

Table B: Capacity Provision and Storage Methods

High-rise Apartment Block	Low-rise Apartment Block
Capacity	Capacity
Capacity equivalent to 14,600 litres See Table 6 (Part 4) for recommended external storage capacities. Following discussion with the Local Authority the capacity split will be 60% (8760 litres) for residual waste and 40% (5840 litres) mixed dry recyclables.	Capacity equivalent to 1560 litres See Table 6 (Part 4) for recommended external storage capacities. Following discussion with the Local Authority the capacity split will be 50% (780 litres) for residual waste, 40% (624 litres) for mixed dry recyclables and 10% (156 litres) for green (garden) waste.
Storage Units	Storage Units
1 x 9.5m ³ portable skip compactor for residual waste. 1 x 9.5m ³ enclosed skip for mixed dry recyclables.	1 x 3m ³ underground waste storage unit for residual waste. 1 x 3m ³ underground waste storage unit for mixed dry recyclables. 1 x 240 litre wheelie bin for garden waste.

Systems, Supporting Infrastructure and Additional Provision

The systems used to convey waste from the point of generation to the point of temporary storage are detailed in the table below. Facilities Management is a fundamental requirement for both blocks – essential for maintenance and servicing.

Table C: Transit of Waste

High-rise Apartment Block	Low-rise Apartment Block
Residual Waste and Mixed Dry Recyclables	Residual Waste and Mixed Dry Recyclables
Chute system accessible from each floor. The system comprises 2 separate chutes allowing the segregation of waste - one chute feeding the portable skip compactor with residual waste, the other feeding the enclosed skip with mixed dry recyclables.	Resident transit. Residents are required to carry their waste from the point of generation and deposit it through the ground level receptacle to the appropriate underground storage container – i.e. for residual waste or mixed dry recyclables.
Food Waste	Food Waste
Collected on a door to door basis in the caddy provided by the Community Trust. Caddy replaced.	Collected on a door to door basis in the caddy provided by the Community Trust. Caddy replaced.
Bulky Waste	Garden Waste
Residents are advised to contact Facilities Management where bulky waste items arise. A store room is provided for bulky waste items. The store is checked periodically by Facilities Management and collection arrangements made with the Community Trust as appropriate.	Collected by the Community Trust for composting.
	Bulky Waste Residents are advised to contact Facilities Management where bulky waste items arise. They will then transfer it to the store room at the high-rise block.

As regards the Community Trust and the collection of food waste, the high-rise and low-rise apartment blocks have each been provided with a motorised flat bed trolley by the developer to which a suitable frame and containment structure has been added. This enables them to easily collect and replace

receptacles on a door to door basis utilising the service lifts installed in each block.

Facilities Management and Maintenance

The developer had written into the property deeds a requirement for the provision of a Facilities Management service. This is provided on a contract basis for the upkeep of the apartment blocks (and in the case of the low-rise development this includes upkeep of the communal gardens). A maintenance charge is levied upon residents for this service.

As part of their contract, it has been agreed that the Facilities Management service provider will monitor and maintain records on waste from the developments. Waste audits are undertaken periodically and allow for adjustments to be made in waste management (such as collection frequency) ensuring the most efficient service possible is provided.

In addition, Facilities Management work in partnership with the Local Authority to provide education and information to residents on a range of matters including waste management. Up-to-date information is made available in common areas.

Waste Collection

For the high rise development, access to the waste compound where the skips are located is via a separate road from that to the residents car park. The collection vehicle reverses down the access road to collect the unit. The replacement unit is delivered in the same way.

The bulky waste store is located adjacent to the waste compound.

For the low-rise development, the underground waste storage units are accessible from the road and are lifted out by crane arm, emptied and replaced.

Bring Site

The new development entails the installation of a new Bring Site to serve the development itself and the wider area. Four underground banks each with a capacity of 5m³ have been installed. They are located close to the road and can be serviced in the same manner as that outlined for the low-rise development.

Summary and Conclusion

For flats and apartments it is unlikely that any one option will provide a complete solution to segregation, storage and collection of waste. An integrated and considered approach is required.

To ensure adequate waste management this model demonstrates:

- Consultation with the Local Authority;
- Completion of the RECAP Waste Management Design Guide Toolkit;
- The use of legal agreements;
- Appropriate design;
- Co-operation with Community Groups; and
- The use of a variety of waste infrastructure.

CASE STUDIES

The following Case Studies are presented as examples only of real life practice. To the best of the authors knowledge the information detailed is correct at the time of publication.

Access Planning, Huntingdon

A block of flats to 3 floors and a community centre were constructed in the centre of Huntingdon. Huntingdonshire District Council were consulted extensively on the development from the design stage through to project completion. Through the Environment and Planning Department, contact was made with the Waste Collection Department.

Following consultation, designers ensured:

- Sufficient width at access points and along access corridors to permit the type of refuse vehicle employed by the council;
- Short distances between the public highway and the waste storage compound;
- Unobstructed access to refuse collection points – e.g. car-parking located away from waste storage compound;
- Short distances for collection crews to move waste receptacles;
- Flat or very low-graded surfaces from the public highway to the waste storage compound;
- Dropped kerb lines and rounded corners permitting improved access for collection vehicles.

In addition, in their original plans, the designers were looking to create an archway, spanning the entrance providing access to the waste chambers.

After consultation, it was decided to drop this feature due to minimum height requirements of the refuse collection vehicles.

Underground Storage of Waste, Peterborough

Peterborough City Council have installed a number of underground waste storage banks at various areas across the city. The scheme is being run in partnership with Huntingdonshire District Council.

Underground units have been installed at multi-occupancy residential developments and within areas of mixed use acting as bring sites. In residential locations, the units are being used to collect mixed dry recyclables and residual waste. Where installed in mixed use areas, the units are used to collect segregated recyclables.

A hiab vehicle services the unit. Via remote control, the crane arm raises the unit up above the storage container of the vehicle. Trap doors at the bottom are released, again by remote control, and the waste deposited.

- The underground system has a number of advantages:
- Unobtrusive visible street furniture with storage unit located below ground and out of sight;
- Large capacity;
- Modular construction minimises risk of pollution to the environment – reinforced concrete liner with galvanized steel container with welded joints;
- Problems from waste odours and noise from waste deposit are reduced due to contained nature of the system.

Across Peterborough the underground waste storage solution is held as having high potential.

Recycling in Flats Everyday (RIFE), Bristol

Out of the 173,000 households in Bristol, 27,000 are flats with most being unsuitable for kerbside collection of recyclables using the standard 'black box' containers. However, with the development of a network of 300 Mini Recycling Centres (MRCs) across the city, residents living in flats and apartments can now recycle their paper, cans and glass.

Since its inception in 2004, the RIFE project has worked at a community level with residents, caretakers, scheme managers, housing officers and agents encouraging them to use the MRCs for all their recyclables. Sites served range from high to low rise blocks and include everything from prestigious city centre apartments to suburban sheltered housing schemes.

RIFE workers have distributed 10,000 reusable 'Recycling Bags' to households served by an MRC. The bags, made from woven polypropylene are designed to hold a week's worth of recyclables. Washable and easily stored when not in use, the bags carry information about all the materials that can be recycled at the MRC. At the original 120 sites RIFE worked at between spring 2004 and 2007 the amount of materials collected increased from 250 tonnes to 440 tonnes, an increase of 75%.

The RIFE project is now working with residents, caretakers and agents at all 300 current sites to promote the use of the MRCs and is working with Bristol City Council to add another 200 sites to the network in the next few years.

For further information see: www.recyclingconsortium.org.uk

Offshoots Community Composting Scheme

The Offshoots project is a community project in Burnley, Lancashire. It is managed by Groundwork East Lancashire and by its own committee of local people.

This project involves collecting household kitchen waste and taking it back to Offshoots and turning it into compost using three machines called 'Rockets' which have been engineered by Accelerated Compost Limited. Instead of taking several months to make compost (as standard processes allow), the Rockets take only 2 weeks.

Compost officers first go out and collect the kitchen waste from participating households in a bio-diesel powered vehicle and then add the kitchen waste into the 'Rockets' with wood chip to provide the correct balance of carbon material (wood chip) to nitrogen material (kitchen waste). The mixture then spends 2 weeks within the 'Rockets' slowly decomposing. When ready, the compost is stored prior to being sold to the council's Parks Department for use within the grounds of Towneley Hall.

For further information see: www.offshoots.org.uk

Tower Hamlets Community Recycling Consortium (THCRC)

THCRC is a not-for-profit local community recycling company in Tower Hamlets. Its broad aim is to increase level of recycling from households and other sectors within the area. THCRC was formed partly to satisfy the strategy of the local authority who were determined that partnership working with local community groups was the best way to meet the recycling needs of a borough with many high-rise flats. THCRC is a member of London Community Recycling Network and the National Community Recycling Network. They operate a large scale door to door recycling scheme serving a great number of residents in high-rise flats. They currently collect 13 types of waste material for recycling from residents doorsteps using a 'green box' system. Working in partnership with Estate Management Boards, Tenant Management Associations and local residents, 30000 green boxes and information leaflets have been distributed to households in the high rise estates. Residents are

asked to leave their green boxes outside their front doors in the corridors on the appointed day of collection. On the day of collection trained operatives, utilising a special recycling trolley, pass through the buildings via the lifts and corridors and sort the contents of the green box into various compartments (bulk bags are hung by their straps on a top frame divided into seven sections). which can then be removed from the trolley when full and left, after securing it with a bungee cord, in a side alley on each floor, until the whole floor is completed.

For further information see: www.westminster.gov.uk

Waste Recycling Chutes in Paddington

Westminster City Council has successfully converted a refuse collection chute at a high-rise residential estate (Hallfield Estate) in Paddington. Since installation in November 2006, recycling rates on the estate have tripled and Westminster City Council is considering introducing the scheme across the borough. The chute system now allows residents to segregate recyclable materials from residual waste and accepts all recyclable material types collected by the council as mixed dry recyclables. Deposited materials fall into a soundproof bin which significantly reduces noise nuisance.

For further information see: www.thcrc.co.uk

APPENDIX A - EXTERNAL AND INTERNAL STORAGE UNITS

External Storage Containers

Dimension

Two-wheeled Containers and Boxes	
Container Type	Typical Dimensions (l x w x h)(mm)
140 litre wheelie bin	500 x 555 x 950
240 litre wheelie bin	580 x 740 x 1100
360 litre wheelie bin	480 x 880 x 1100
55 litre box	395 x 585 x 375
38 litre box	385 x 585 x 275

Four-wheeled Containers	
Container Type	Typical Dimensions (l x w x h)(mm)
1280 litre	1280 x 1000 x 1445
1100 litre	1270 x 1000 x 1380
820 litre	1250 x 1800 x 1370
770 litre	1265 x 810 x 1360
660 litre	1265 x 740 x 1320
500 litre	1305 x 745 x 1145

Figure 5: 240 litre two wheeled container

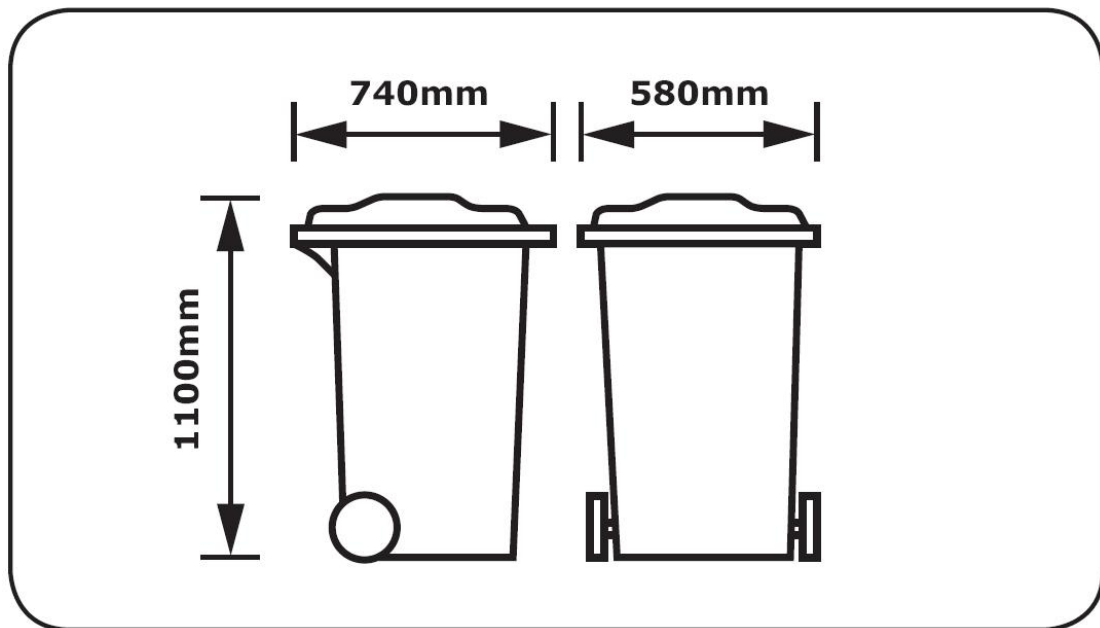


Figure 6: 660 litre four wheeled container

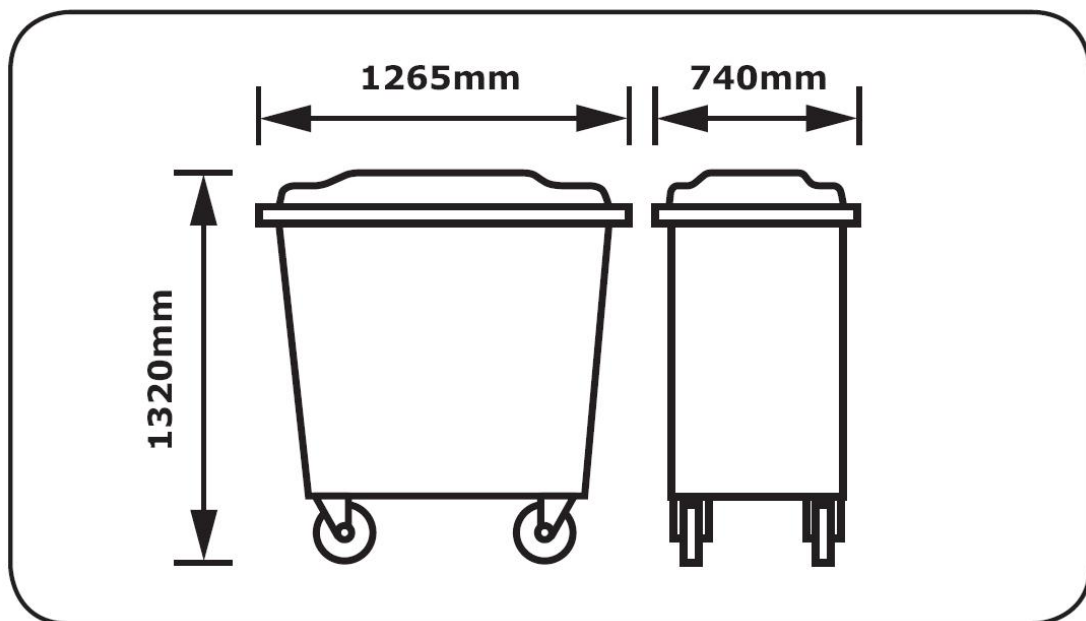
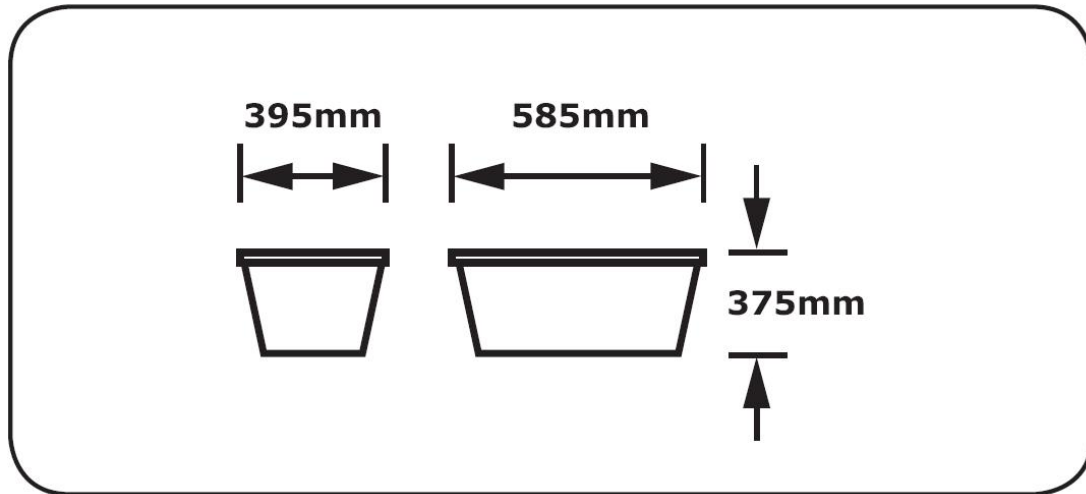


Figure 7: 55 litre box

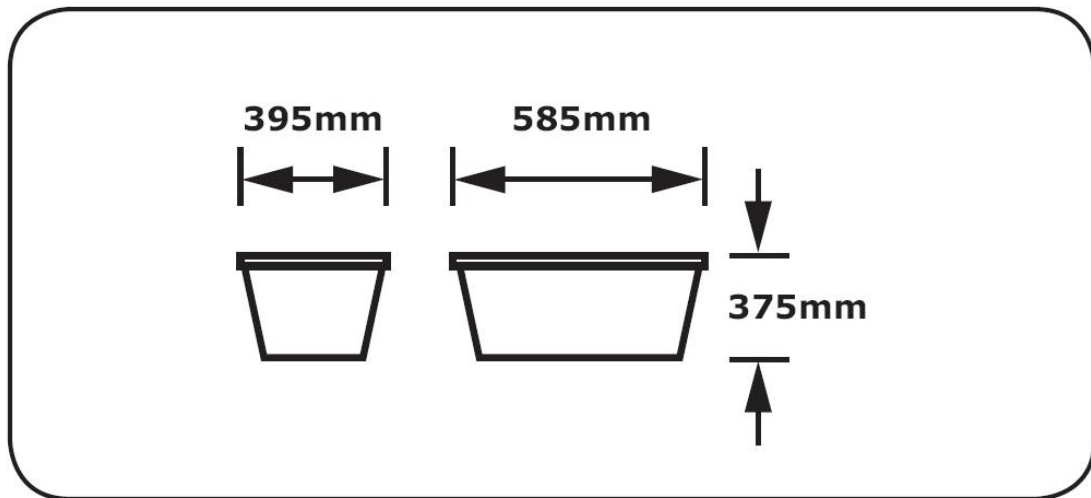


Underground Systems

Typical dimensions are as follows:

Unit Capacity	Typical Dimensions (mm)
3m ³ Capacity	Below Ground Component (l x w x h) 1430 x 1430 x 1604 Above Ground Component (l x w x h) 900 x 620 x 890 Ground Area Required 1720mm ²
4m ³ Capacity	Below Ground Component 1430 x 1430 x 2139 Above Ground Component 900 x 620 x 890 Ground Area Required 1720mm ²
5m ³ Capacity	Below Ground Component 1430 x 1430 x 2674 Above Ground Component 900 x 620 x 890 Ground Area Required 1780mm ²

Figure 8: 4m³ underground storage system



Internal Storage Containers

A wide range of internal bins are available and below only a selection of dimensions are illustrated.

Single Compartment Examples - Freestanding	
Container Type	Typical Dimensions (mm)
40 litre bin (semi-cylindrical)	435 (l) x 302 (w) x 716 (h)
30 litre bin (cylindrical)	722 (h), 293 (Ø)
20 litre bin (cylindrical)	717 (h), 251 (Ø)
38 litre bin (cuboid)	400 (l) x 310 (w) x 648 (h)
45 litre (cuboid)	400 (l) x 280 (w) x 737 (h)

Multi-Compartment Examples - Freestanding	
Container Type	Typical Dimensions (mm)
Two Compartments 30 litre capacity (1x19 litre and 1 x 11 litre housed in one unit)	47 (l) x 25 (w) x 44 (h)
Three Compartments 33 litre capacity	47 (l) x 25 (w) x 44 (h)

(3 x 11 litre housed in one unit)	
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Multi-Compartment Examples - Fitted	
Container Type	Typical Dimensions (mm)
Three Compartments 40 litre capacity (1 x 19 litre, 1 x 12 litre and wire frame housing)	For installation in hinged door cabinets. To fit cabinet with minimum of 500mm horizontal clear space and a height of 525mm.
Four Compartments 39 litre capacity (1 x 12 litre and 3 x 9 litre seated in single wire frame housing)	For installation in hinged door cabinets. To fit cabinet with minimum of 500mm horizontal clear space and a height of 525mm.
Three Compartments plus 2 Cleaner Baskets 43.2 litre capacity (1 x 18 litre and 2 x 8.5 litre plus 2 x 4.1 cleaner baskets housed in one unit)	For installation in drawers or door front fixing cabinets. Minimum 433mm depth and height of 320mm.
Three Compartments plus 2 Cleaner Baskets 37.2 litre capacity (1 x 12 litre and 2 x 8.5 litre plus 2 x 4.1 cleaner baskets housed in one unit)	For installation in drawers or door front fixing cabinets. Minimum 433mm depth and height of 320mm.

APPENDIX B - COMPACTOR USE, DESCRIPTIONS AND SPECIFICATIONS

Compactor Type and Description	Typical Dimensions
<p>Small Sack Compactor</p> <p>Waste is tipped into the cylinder cabinet, which is lined with a plastic waste sack, and compacted.</p> <p>Available as a cylindrical or cabinet type. A compaction ratio of up to 4:1 can be achieved.</p>	<p>Dimensions (m): Width 0.78 Length 0.98 Raised Height (standard model) 2.68 Raised Height (short model) 2.38 Floor area 1m</p>
<p>Wheeled Bin Compactor</p> <p>Bins are wheeled beneath the compaction plate of the unit which then compacts the waste while in the bin. Two types are available – one using 360 litre bins, the other using 660 or 1100 litre bins. A compaction ratio of up to 3:1 can be achieved.</p> <p>It must be noted that compacted waste in a wheeled bin must not exceed weight limits or be too compacted so as not to empty.</p>	<p>Dimensions for compactor to fit 360 litre bins (m): Width 0.9 Length 1.6 Working Length 2.9 Height 2 Floor area 2.6m²</p> <p>Dimensions for compactor to fit 660 and 1100 litre bins (m): Width 1.5 Length 1.9 Working Length 4 Height 2.5 Floor area 7.2m²</p>
<p>Rotary Compactor</p> <p>Waste is placed into the compactor which features a spiked rotating head which tears and subsequently compacts the waste.</p> <p>High compaction ratios can be achieved.</p>	<p>Typical dimensions for a bag type rotary compactor (m): Width 1.35 Working Length 2.37 Raised Height 3.08</p>

<p>Portable Skip Compactor</p> <p>These effectively form an enclosed skip combined with a fixed compactor unit. The entire unit may be removed. Range of sizes with typical capacities being 9.5m³ and 27m³. A Compaction ratio of up to 4:1 can be achieved.</p>	<p>Dimensions for 9.5m³ portable skip compactor (m): Width 1.75 Length 4.28 Height 2.34</p> <p>The area where such a compactor is to be located should have the following minimum dimensions (m): Width 4.5 Length 5.8 Height 4.9</p> <p>Dimensions for 27m³ portable skip compactor (m): Width 2.5 Length 6.63 Height 2.75</p> <p>The area where such a compactor is to be located should have the following minimum dimensions (m): Width 5 Length 8.63 Height 6</p>
<p>Static Compactor</p> <p>The compactor is secured to the ground and compacts waste in a removable fully enclosed skip. Range of sizes with typical capacities being 10.5m³ and 27m³. A compaction ratio of up to 5:1 can be achieved.</p>	<p>Dimensions for 10.5m³ static compactor (m): Width 1.8 Length 6.6 Height 2.4</p> <p>The area where such a compactor is to be located should have the following minimum dimensions (m): Width 4.5 Length 8 Height 4.9</p> <p>Dimensions for 27m³ static compactor (m): Width 2.5 Length 10.2 Height 2.8</p> <p>The area where such a compactor is to be located should have the following minimum dimensions (m): Width 5 Length 12.2 Height 6</p>

Use of Compactors

For both multi-occupancy residential developments and commercial developments it may be prudent to use compactors.

It must be noted that where the use of a compactor is being considered, evaluation must be given to servicing and wider infrastructure requirements – i.e. adequate access for suitable collection vehicles must be provided along with adequate working areas and the wider road network must be capable of accommodating the required service vehicles. The relevant Local Authority should always be consulted where the use of skip containers and waste compaction systems are being considered.

For commercial developments in particular, the following recommendations are made:

Development Type and Floor Space	Equipment Recommendation
*Offices over 10,000m ²	Rotary Compactor
*Offices over 15,000 m ²	Portable Skip Compactor
Light Industrial Units with Combined Floorspace over 1500 m ²	Small Sack Compactor
Retail Premises – up to 5000 m ²	Small Sack Compactor
Retail Premises – over 10,000 m ²	Portable Skip Compactor or a large Static Compactor
Fast Food Restaurants (eat in facility)	Small Sack Compactor
Fast Food Restaurants (high output)	Rotary Compactor
Hotels – up to 250 beds	Small Bag Compactor
Hotels – over 250 beds	Rotary, Portable Skip or Static Compactor

*For all offices over 2500m² some form of waste compaction is recommended. (Source: City of Westminster Council)

Descriptions and Specifications

The information in the following table has been adapted from the City of Westminster document Clean Streets, Waste and Recycling Storage Requirements.

Figure 9: 9.5m³ portable skip compactor.

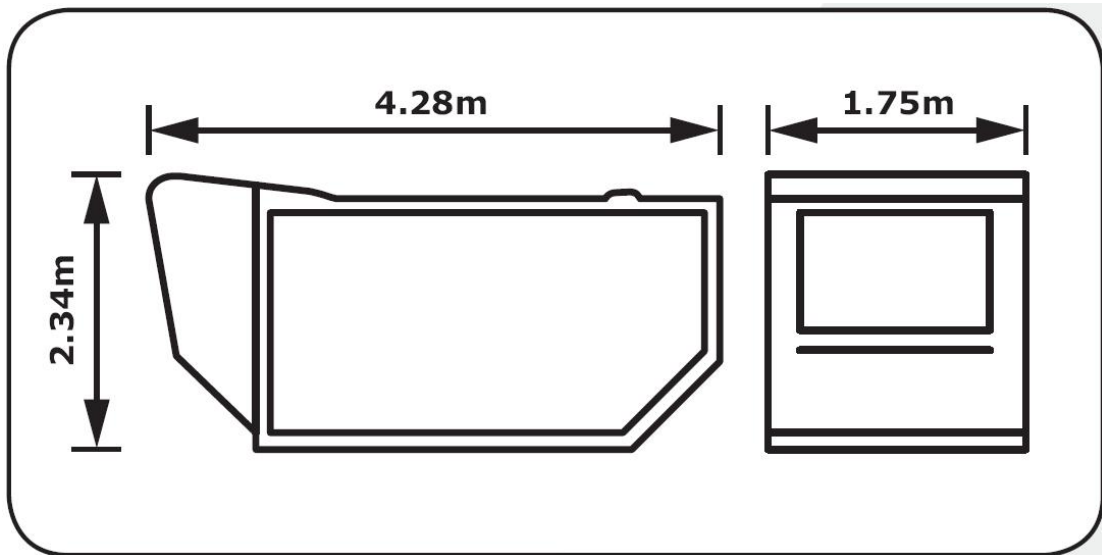
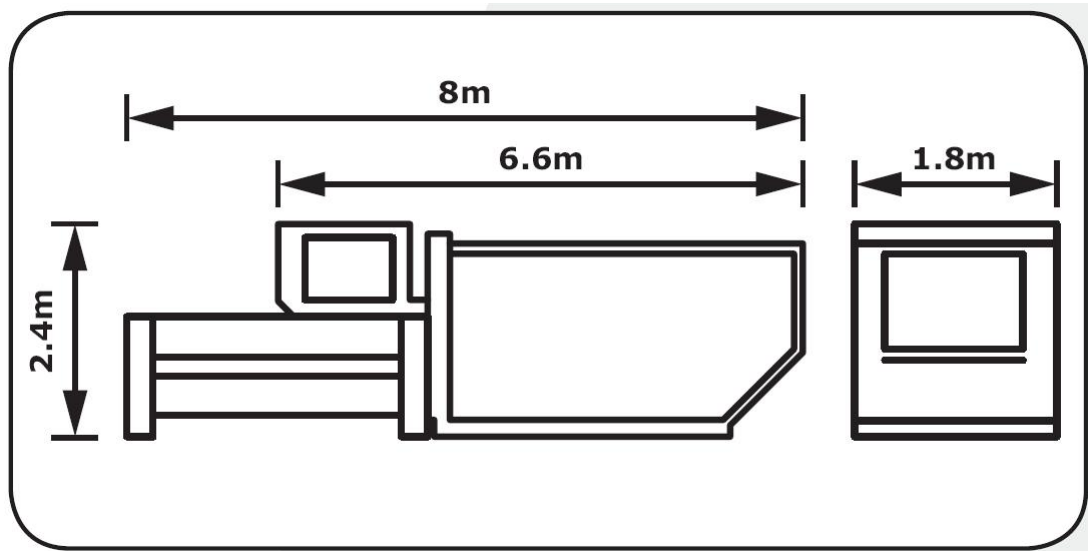


Figure 10: 10.5m³ static compactor.



APPENDIX C - CURRENT LOCAL AUTHORITY COLLECTION FREQUENCIES

Authority	Residential Collection Frequency	Commercial Collection Frequency
Cambridge City	Residual Waste Alternate weekly Dry Recyclable Service Alternate weekly (Collected same day/week as Green waste) Green Waste Service Alternate weekly	As Required
East Cambridgeshire	Residual Waste Weekly Dry Recyclable Service Alternate weekly (Collected same day/week as Green waste) Green Waste Service Alternate weekly	Private Contract
Fenland	Residual Waste Alternate weekly	As Required

	<p>Dry Recyclable Service Fortnightly (Collected same day/week as Green waste)</p> <p>Green Waste Service Alternate weekly</p>	
Huntingdonshire	<p>Residual Waste Alternate weekly</p> <p>Dry Recyclable Service Alternate weekly (Collected same day/week as Green waste)</p> <p>Kerbside Green Waste Service Alternate weekly</p>	Weekly
South Cambridgeshire	<p>Residual Waste Alternate weekly</p> <p>Dry Recyclable Service Fortnightly (Collected same day/week as Green waste)</p>	3 times a week

	Green Waste Service Alternate weekly	
Peterborough	Residual Waste Alternate weekly Dry Recyclable Service Fortnightly (Collected same day/week as Green waste) Green Waste Service Alternate weekly	As required

(Source: RECAP)

To the best of the authors knowledge the information detailed is correct as at 1st September 2009.

APPENDIX D - DESIGN SPECIFICATIONS FOR WASTE STORAGE COMPOUNDS

Feature	Design
Walls and Roofs	To be made of a non-combustible, robust, secure and impervious material with a fire resistance of 1 hour (as tested in accordance with BS 476-21).
Floors	To be made from a hard impervious material with a smooth finish and a minimum thickness of 100mm. There should not be any steps or projections present at the entrance.
Doors	Width to be 1.8m – 2m (minimum). To be made of steel or of some other material with a fire resistance of 30 minutes (as tested in accordance with BS 476-22). Should also be self-closing except where they communicate directly with the outside air. Should be hung so that hinges are not damaged where the doors are allowed to swing wide. Should be capable of being opened from the inside and outside to prevent the risk of individual users becoming trapped.
Door Frames	To be metal, hardwood or metal clad softwood. Door frames should also be situated in the external wall and rebated into the reveals of the opening.

Junctions of Walls with Floors	To be coved with the coving formed to prevent damage to the walls from the containers - in accordance with BS 1703
Drainage	To be via a trapped gully connecting to the foul sewer. Floors should have an appropriate fall towards the drainage point.
Ventilation	Areas for ventilation to be situated as near to the top and bottom of the container as possible with the total ventilation area to be not less than 0.2m ² .
Lighting	Electrical lighting to be provided by bulkhead fittings within the storage compound with housings rated to IP65 in BS EN 60529:1992. Luminaires to be low energy light fittings and switching should be via proximity detection or time delayed.
Cleansing	A hose union tap with water supply should be provided at the compound.
Access Paths	Should be a minimum of 2m wide and feature a hard finished surface.

(Adapted from: BS 5906:2005)

APPENDIX E - WASTE STORAGE COMPOUND SECURITY

Compound Location

Subject to carry distances, it is preferable that storage compounds be separate and located away from the main building(s).

Where this can not be achieved, it should be possible to secure the main building from the compound.

BS 5906:2005 Waste Management in Buildings – Code of Practice recommends that where a storage compound forms part of a building it should have 2 access points – one internal with a secure lock, the other external allowing access for collection (also acting as the only point of egress from the compound).

Compound Locks

It is preferable that compounds are secured by a universal lock and key mechanism (standard Fire Brigade mortise lock and key). Though keys for these locks are widely available, they represent the best option in terms of operational efficiency.

Other options include electronic key code entry systems or call systems. However, these systems may present issues in terms of operational efficiency – for example where the key code is changed but no notification given to the Waste Collection Authority or where management are absent and unable to permit entry of a collection crew.

APPENDIX F - WASTE COLLECTION VEHICLE TRACKING PATH

Driving into cul-de-sac

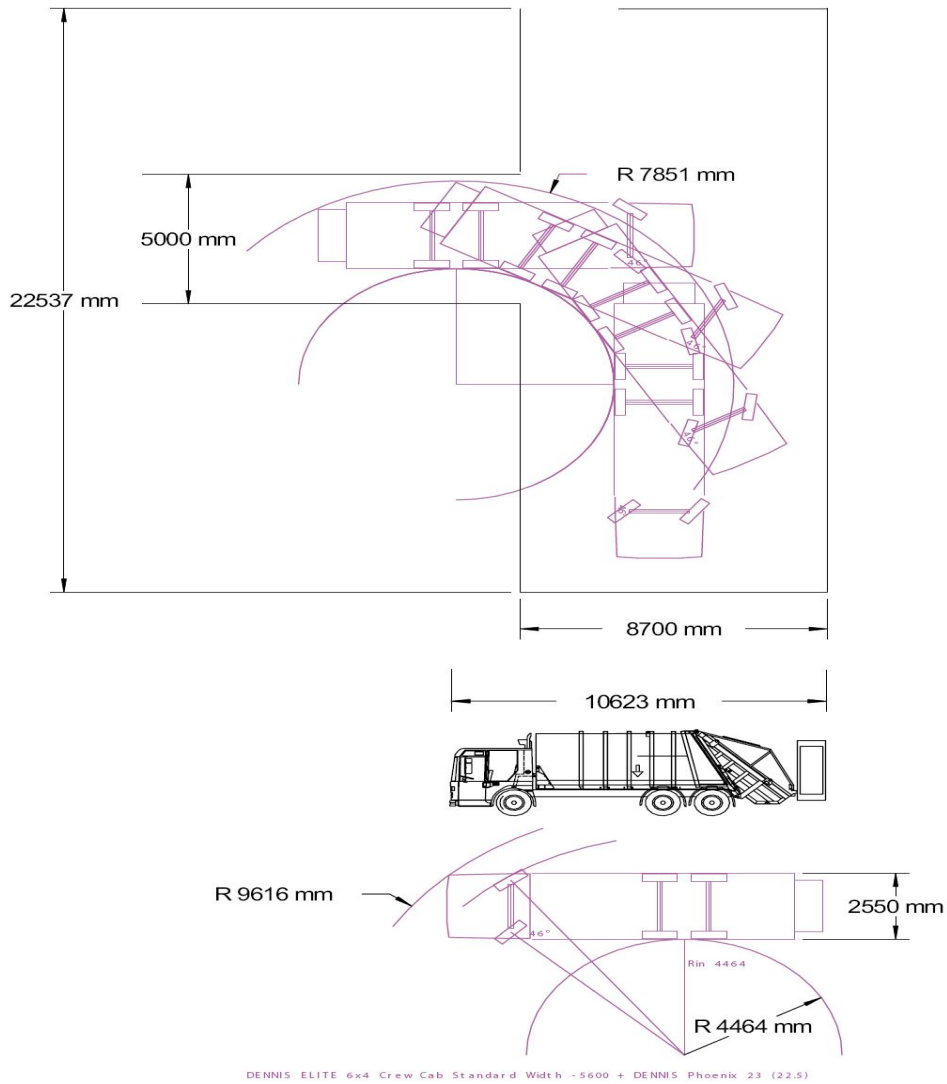


Diagram courtesy of Dennis Eagle.

Reversing into cul-de-sac

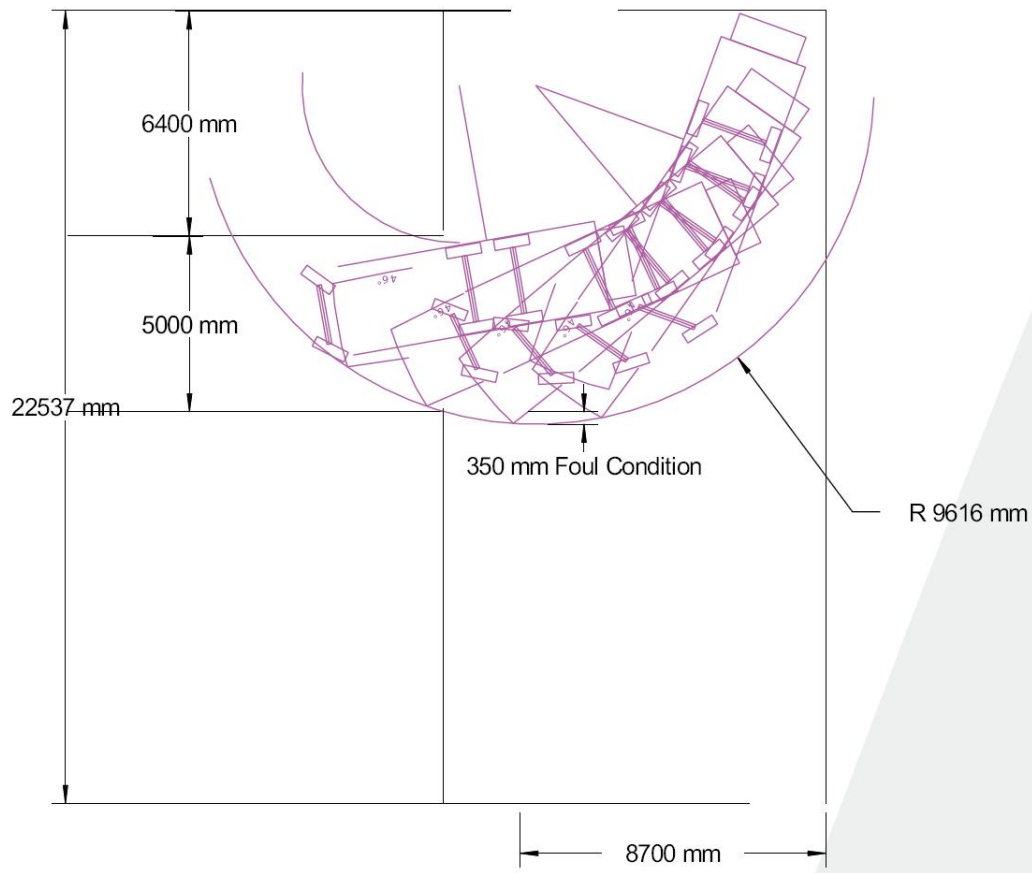


Diagram courtesy of Dennis Eagle.

APPENDIX G - TYPICAL SPECIFICATIONS FOR AN UNDERGROUND BRING SITE

The Specification

- 1) Systems must be suitable for paper, cans, plastics and glass recycling.
- 2) The Underground bank walk-on platform must be:
 - a) Manufactured using a welding construction, which is hot-tip galvanised, and
 - b) Non slip (to a degree), and
 - c) Highly durable, and must not move or give in any way and is capable of withstanding a weight of at least 150kg, and
 - d) Be constructed in such a way to prevent the ingress of water into the storage container or concrete casing, such as through an overlapping design.
- 3) Underground banks must be provided with an automatic rising safety platform, the safety platform must:
 - a) Be made of galvanised steel, and
 - b) Be able to carry a load of at least 150-kg – suitable for two persons when the storage container is not in place and
 - c) The empty shaft must be fully sealed when the safety platform seal is raised to ensure maximum safety.
- 4) The underground storage container must be housed in a Concrete Casing, the concrete casing must be:
 - a) 100% waterproof, and
 - b) If the underground bank is sited in an area with a high water table or on Pulverised Fuel Ash (PFA) it must be fully secured or set with stilts to avoid any movement after installation, and
 - c) The casing must be fully approved under the relevant European directive(s) and either UK or equivalent industry standard such as BSI or KEMA (Dutch) or equivalent must be held.

- 5) The storage container must be:
 - a) Manufactured from galvanised steel and sealed with fully welded joints, and
 - b) Fitted with a trap door to allow emptying of container, and
 - c) The contractor or supplier must also be able to provide maintenance works for the container if required; such as for broken “trap door”, and
 - d) The container should be available in sizes of 4m³ and 5m³.
 - e) Be fitted with remote fill level alarms/indicators
- 6) The “column” or “refuse receptacle” should:
 - a) Be available in a range of styles and colours that best match the surrounding built environment, and
 - b) Be available with a range of receptacles which best suit the specific material such as a “multiple different coloured circular receptacles” for glass or “single circular receptacle” for glass, and
 - c) Be available with a clear visually appealing marking which indicates which type of material should be placed in the receptacle.
- 7) Lifting mechanism to aid emptying of storage container should be available:
 - a) To integrate with relevant Council lifting equipment e.g. with 2 exposed apertures for use with a hook and hydraulic arm arrangement.
- 8) It must be possible to empty liquid and solid residues from the container by providing suitable access for pipes from a vacuum tanker.
- 9) During Installation, the contractor must:
 - a) Take full responsibility for the installation¹ of the underground banks, and be able to provide a turn key arrangement and therefore provide their own staff for this purpose of installation

¹ Installation is defined as including the process of checking correct and proper levelling of excavation works, arrangement and fixing of outer concrete casing into one solid unit, lowering of concrete casing, fixing concrete casing to ground in high water table to avoid post installation movement of casing.

(Detail adapted from Peterborough City Council generic specification)

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