09 Waste and Recycling

09 Waste and Recycling

Introduction

9.1 This chapter of the ES is an informative chapter which relates to waste management considerations of the Proposed Development. The chapter has been written by URS Infrastructure and Environment UK Ltd (URS) with information supplied by HOK Architects and Jacobs (sustainability consultants). Key activities of the Proposed Development with regards to waste management are set out and a brief description of the Site Waste Management Plan (SWMP) is provided.

Legislation and Planning Policy

9.2 This section reviews waste legislation considered relevant to the Proposed Development site. In addition, the national, regional and local waste management planning policy requirements within the London Borough of Camden (LBC) that relate to the Proposed Development are also discussed.

Summary of Relevant Legislation

9.3 Most of the key UK waste related legislation has been derived from EU Directives that have been transposed into UK law via the following legislative instruments:

- Clean Neighbourhoods and Environment Act 2005 (Ref. 9-1);
- Control of Pollution (Amendment) Act 1989 (COPA) (Ref. 9-2);
- The Environment Act 1995 (Ref. 9-3);
- The Environmental Protection Act 1990 (EPA) (Ref. 9-4);
- The Animal By-Products (Enforcement) (England) Regulations 2011 (Ref. 9-5);
- The Controlled Waste (England and Wales) Regulations 2012 (Ref. 9-6);
- The Environmental Permitting (England and Wales) (Amendment) Regulations 2012 (Ref. 9-7);
- The Environmental Protection (Duty of Care) (England) (Amendment) Regulations 2003 (Ref. 9-8);
- The Hazardous Waste (England and Wales) (Amendment) Regulations 2009 (Ref. 9-9);
- The List of Wastes (England) (Amendment) Regulations 2005 (Ref. 9-10);
- The Packaging (Essential Requirements) (Amendment) Regulations 2009 (Ref. 9-11);
- The Producer Responsibility Obligations (Packaging Waste) (Amendment) Regulations 2012 (Ref. 9-12);
- The Site Waste Management Plans Regulations 2008 (Ref. 9-13);
- The Waste Batteries and Accumulator Regulations 2009 (Ref. 9-14);
- The Waste Electrical and Electronic Equipment (WEEE) (Amendment) Regulations 2010 (Ref. 9-15);
- The Waste (England and Wales) Regulations 2011 (Ref. 9-16); and
- The Waste Management (England and Wales) (Amendment) Regulations 2012 (Ref. 9-17).

National Policy

Waste Strategy for England 2007

9.4 The National Strategy for Waste (Ref. 9-18) sets out the Government's views on waste management in England. The strategy commits to setting new national targets for the reduction of household waste through recycling and composting by at least 45% by 2015 and 50% by 2020, in comparison to 2000 levels. The Department for Environment, Food and Rural Affairs (Defra) is dedicated to the ongoing monitoring of waste and is committed to the continued reviewing of targets to maintain a sustainable waste strategy.

Government Review of Waste Policy in England 2011

9.5 In order to ensure that the UK is on the path towards a 'zero waste' economy, a review of all waste policy in England was undertaken in 2011 (Ref. 9-19). The review found that waste management has made significant progress over the last ten years. However, it also identified a number of challenges, most notably ensuring waste prevention wherever possible and increasing recycling of waste for both households and businesses. The review also highlighted the need to deliver environmental benefits, support economic growth and ensure a more sustainable approach to the use of materials whilst improving waste services.

National Planning Policy Framework

9.6 The National Planning Policy Framework (NPPF) (Ref. 9-20) was published on the 27 March 2012 and states that the framework does not contain specific waste policies, therefore, Planning Policy Statement 10: Planning for Sustainable Waste Management (PPS10) (Ref. 9-21) will remain in place until the National Waste Management Plan for England is published.

Planning Policy Statement 10: Planning for Sustainable Waste Management

9.7 PPS10 will remain a material planning consideration until the National Waste Management Plan is published. PPS10 provides policy advice to help councils and individual developers deliver waste management facilities and to manage waste more effectively. The overall objective of PPS10 is to protect human health and the environment by producing less waste and by using it as a resource wherever possible. Under PPS10, planning authorities are required to prepare strategies that deliver the following objectives:

- Help deliver sustainable development through driving waste management up the waste hierarchy, addressing waste as a resource and looking to disposal as the last option;
- Help implement the key objectives and targets from the National Strategy for Waste; and ensure consistency with obligations required under European waste legislation and other relevant guidance and legal controls; and
- Ensure the design and layout of new development supports sustainable waste management.

Regional Policy

The London Plan 2011

9.8 The London Plan (Ref. 9-22) outlines the Mayor's commitment to making better use of waste and its management in an attempt to reduce London's impact on climate change. The London Plan describes London's waste as a valuable resource that can be exploited for London's environmental, economic and social benefit. It also emphasises the importance of the following policies in relation to waste management and these are outlined in Table 9-1.

Table 9-1 The London Plan 2011 Waste Management Policies

Policy	Description
Policy 5.3 Sustainable Design and Construction	States that the highest standard of sustainable design and construction should be achieved in developments to improve the environmental performance of new developments. This should be achieved through a number of sustainable design principles including minimising the generation of waste and maximising reuse and recycling.
Policy 5.16 Waste Self-sufficiency	States that the Mayor will work with various stakeholders and authorities to ensure that by 2031, 100% of London's waste will be managed within London and zero biodegradable or recyclable waste will be sent to landfill.
Policy 5.17 Waste Capacity	States the need to increase the waste processing capacity in London and that all new developments should have suitable waste and recycling storage facilities.
Policy 5.18 Construction, Excavation and Demolition Waste	States that waste should be removed from construction sites, and materials brought to the site, by water or rail transport wherever that is practicable.

The GLA Supplementary Planning Guidance - Sustainable Design and Construction

9.9 The Greater London Authority (GLA) Supplementary Planning Guidance (SPG) Notes (Ref. 9-23) were produced to provide additional detail regarding certain policies of the London Plan. In relation to waste and recycling, SPG Sustainable Design and Construction promotes sustainable construction across London.

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Key standards are set as part of this SPG for a range of sustainability issues, including sourcing of materials (section 2.3.3) and waste management within new developments (section 2.7) with the aim to minimise, reuse and recycle as much as is physically practicable. Under this guidance it is also required that by 2020 there will be sufficient provision of facilities to recycle 70% of Commercial and Industrial waste.

The Business Waste Management Strategy

9.10 In addition to the policies outlined in the over-arching London Plan, the Business Waste Management Strategy (Ref. 9-24) provides further policy guidance on the management of business waste. It sets out initiatives to help many different London businesses including shops, restaurants and offices, save money and reduce harm to the environment through better waste management practices. The strategy is aimed at encouraging waste reduction and promoting better re-use and recycling from commercial activities. It looks to improve the efficiency of resource management and reduce the financial and environmental impact of waste by managing as much of it within the London boundaries as is practical.

The Municipal Waste Management Strategy

9.11 The Municipal Waste Management Strategy (Ref. 9-25) provides further policy guidance on the management of municipal waste in addition to policies contained within the overarching London Plan. The strategy aims to reduce the amount of municipal waste generated by the capital and significantly increase recycling and composting performance. Municipal waste that cannot be re-used or recycled will be used to produce energy from waste in the most environmentally sensitive way possible. As part of the Municipal Waste Management Strategy, six additional targets have been set and these are listed in Table 9-2.

Table 9-2 The Municipal Waste Management Strategy Targets

Target	Description
Target 1	Achieve zero municipal waste sent directly to landfill by 2025.
Target 2	Reduce the amount of household waste produced in 2008/09 from 970 kilograms (kg) per household to 790kg per household by 2031; this is equivalent to a 20% reduction per household.
Target 3	Increase London's capacity to re-use municipal waste from approximately 6,000 tonnes each year in 2008 to: • 20,000 tonnes a year in 2015; and • 30,000 tonnes a year in 2031.
Target 4	With respect to municipal waste, recycle or compost at least: • 45% by 2015; • 50% by 2020; and • 60% by 2031.
Target 5	Cut London's greenhouse gas emissions through the management of London's municipal waste, achieving annual greenhouse has emission savings of approximately: • 545,000 tonnes of carbon dioxide equivalent (CO_2eq) in 2015; • 770,000 tonnes of CO_2eq in 2010; and • 1,000,000 tonnes of CO_2eq in 2031.
Target 6	To generate as much energy as practicable from London's organic and non-recycled waste in a way that is no more polluting in carbon terms than the energy source it is replacing.

Local Policy

North London Waste Plan

9.12 The North London Waste Plan (NLWP) (Ref. 9-26) sets out the planning framework for waste management in the seven North London Borough's of Barnet, Camden, Enfield, Hackney, Haringey, Islington and Waltham Forest until 2027; collectively these boroughs are referred to as the North London Waste Authority (NLWA). The Proposed Development is situated in the London Borough of Camden (LBC), forming part of the NLWA, and is covered by the NLWP. The NLWP is part of each Borough's Local Development Framework (LDF) and has been drawn up in accordance with national planning policy and the London Plan.

9.13 The NLWP was updated in May 2011 with the vision to reduce reliance on landfill by 2027. The vision of the NLWP ensures that the long term implications of managing waste and developing the sub-region's waste management infrastructure are considered, rather than focusing on short term solutions.

9.14 The London Plan aims for London to be self-sufficient in the management of its waste by 2031 and consequently, each borough has been asked to deal with a proportion of London's total waste (the apportionment). Like many other areas of London, the seven North London Boroughs have pooled their individual apportionments together and identified waste management sites capable of meeting this combined volume of waste as part of the NLWP.

North London Joint Waste Strategy

9.15 Alongside the NLWP is the North London Joint Waste Strategy (NLJWS) (Ref. 9-27), which provides the strategic framework for municipal waste management in North London for the period 2004-2020. The NLJWS sets out targets for reducing, re-using and recovering a greater proportion of municipal waste generated in the NLWA area and for reducing the total amount sent for disposal to landfill.

North London Waste Prevention Plan

9.16 The North London Waste Prevention Plan (NLWPP) 2012-2014 (Ref. 9-28) aims to reduce municipal waste arisings in North London through a sustainable and detailed programme of waste prevention activities. The NLWPP targets food waste as a priority waste stream and aims to emphasise food reduction messages and an extensive 'Love Food, Hate Waste' campaign. In addition, furniture re-use is proposed as a second focal area alongside a promotion in the reduction of other waste streams such as unwanted mail and textile re-use.

London Borough of Camden Local Development Framework, Core Strategy

9.17 The LBC LDF Core Strategy was adopted on the 8 November 2010 (Ref. 9-29). The Core Strategy sets out the vision and objectives for the Borough up until 2025 and is a central part of the LDF. It covers both the physical aspects and land use of the Borough, as well as social and economic factors and as such plays an integral role in the future development of the LBC.

9.18 The Core Strategy, along with other documents of the LDF, will replace policies of the previously used Unitary Development Plan (UDP) (Ref. 9-30) and form the Statutory 'Development Plan' for Camden, providing a basis for all planning decisions in the Borough. This is a gradual process with a number of UDP policies being saved prior to full implementation of the LBC Core Strategy, however, with regards to waste management all relevant policies of the UDP have been superseded by the LDF.

9.19 With regards to waste management within the LBC, Policy CS13 states that: "…the Council will welcome proposals for energy from waste schemes in suitable locations, where they do not cause harm to the amenity of local occupiers".

9.20 In addition, Policy CS18 seeks to: "…make Camden a low waste Borough…it fully supports the objectives of sustainable waste management to move the management of waste up the 'waste hierarchy' of reduction, re-use, recycling and composting, to use waste as a source of energy where possible, and to only dispose of it as a last resort".

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London Borough of Camden, Supplementary Planning Document: Camden Planning Guidance, Design

9.21 In addition to policies outlined by the LDF and Core Strategy, the LBC have prepared additional guidance for planners and developers in the form of a Supplementary Planning Document (SPD). The SPD covers a range of topics including housing, sustainability and design, and should be read in conjunction with the LDF.

9.22 In relation to waste and recycling, Camden Planning Guidance 1: Design (CPG 1) (Ref 9-31) aims to ensure that appropriate storage for waste and recyclables is provided in all developments in Camden. CPG 1: Design provides guidance's in line with Policy CS18 of the Core Strategy and states that developments should accommodate:

- Adequate space (designed) for the storage of waste and recyclables;
- Designated storage areas for containers; and
- Sensitively designed/located storage facilities, especially in conservation areas/or listed buildings.

Methodology

9.23 This chapter is an informative chapter which:

- Identifies the waste management objectives and targets the Proposed Development is required to comply with (see Legislation and Planning Policy section) of this ES Chapter;
- Describes and defines the main waste streams and systems of the Proposed Development;
- Provides estimates of waste arisings for the main waste streams; and
- Describes the waste management areas and systems that will be considered throughout the construction and operational phases.

9.24 This chapter does not provide an assessment per se, and therefore there is no description of baseline conditions or the requirement to use significance criteria.

Construction Waste

9.25 Estimates of construction waste (composition and quantities) are assumed to be related to the breakout of existing concrete piles and removal of temporary cladding and structures. Further information has been presented in Chapter 6 (Construction) of this ES.

Operational Waste

9.26 Quantities and composition of waste anticipated to be produced by the operation of the Proposed Development, and the waste composition have been calculated and co-ordinated in accordance with the following guidance:

- LBCs CPG 1: Design; and
- LBCs Waste Storage Requirements for Developers of Commercial and Residential Properties (Ref. 9-32).

9.27 The required information for this report (i.e. area schedules) has been provided by HOK Architects.

Residential

9.28 The residential elements of the Proposed Development are aiming to achieve a Code for Sustainable Homes (CfSH) level 4. CfSH states that developments should allow for the greater volume of storage from either of the following: local planning authority guidance or British Standards 5906:2005 Waste Management in Buildings, Code of Practice (BS5906:2005) (Ref. 9-33). As the LBC methodology allows for a more conservative storage allocation, this methodology has been used to calculate the residential waste generation and storage requirements for the operational phase of the Proposed Development.

9.29 Quantities of waste anticipated to be produced by the operational development, and its associated composition, have been calculated and co-ordinated in accordance with the guidance provided by LBC outlined by Table 9-3. As the guidance provided by LBC is given in cubic metres (m^3), the minimum capacity of waste produced per week has been multiplied by 1,000 to provide an estimate minimum weekly capacity in litres (L).

Table 9-3 LBC Residential Capacity Guidelines

Unit Type	Minimum capacity per week (cubic metres) (m^3)	Minimum capacity per week (litres) (L)
1 Bedroom	0.15	150
2 Bedrooms	0.20	200
3 Bedrooms	0.25	250
4 Bedrooms	0.30	300

9.30 On behalf of the Applicant, URS liaised with the Environmental Services Officer at the LBC. Through this correspondence, LBC advised URS on a number of waste management practices throughout the borough which should form the basis of the operational waste strategy; details of this correspondence can be found within Volume III: Technical Appendix C of this ES. As such, the LBC advised the following for the collection of waste produced by the Proposed Development:

- Residual waste will be collected twice weekly from the Proposed Development and as such will require four days worth of storage capacity;
- Dry mixed recyclables will be collected on a weekly basis and will require seven days worth of storage capacity. However, it is noted that collection may increase to twice weekly in the future should the council change their policies regarding collection of recyclable materials;
- Recycling performance should be a minimum of 30% of the total waste arisings with scope included to increase this as policies and practices change in the future;
- Whilst current practice within the LBC is to collect source-segregated recyclable material, the council is moving towards a co-mingled collection system commencing from the summer 2013. As the Proposed Development will only become operational past this date, storage of recyclable material has been based on a co-mingled system as per future LBC requirements; and
- Where possible, the same type of container must be used throughout the development to make collection easier and more cost effective.

Waste Growth Rates

9.31 Inflationary waste growth predictions have not been applied to the waste production estimates for the Proposed Development. Estimates of waste inflation vary widely. Previous statistics for municipal waste growth predicted year-on-year increases in waste production of 2-3% (Ref. 9-34; Ref 9-35). Recent Defra figures have suggested that waste growth has stabilised and may actually be declining at a rate of 0.5% (Ref. 9-36). It is likely that the latter situation is most appropriate to the Proposed Development. This is because the long-term population of the building is unlikely to change significantly, and widespread initiatives to reduce waste and improve materials reuse and recycling are likely to reduce long-term production of waste from the site. Improvements in data centre security and storage and increasing reliance on information technology is also likely to lead to a reduction in paper usage in the long-term. Therefore, it is likely that the current waste production and storage requirements will represent a reasonable worst-case scenario, and as such should form the basis for long-term waste management provisions.

Descriptions of Waste Streams and Systems

9.32 Article 3(1) Directive 2008/98/EC (Ref. 9-37) defines waste as "*any substance or object which a holder discards or intends to discard*". In reality, waste is not a single substance; a residential development (once

operational) such as the Proposed Development, will give rise to a range of different waste types whose method of collection and disposal will vary according to the nature and source of the waste. Table 9-4 provides descriptions of the various waste types that are anticipated to be generated from the Proposed Development. Management responsibilities are also discussed.

Table 9-4 Waste Descriptions and Responsibility

Waste Type	Description	Responsibility
Biodegradable Municipal Waste (BMW)	BMW is the fraction of municipal waste which will undergo degradation processes within landfill and consequently release methane emissions. It is convenient to define BMW by reference to the component materials into which municipal waste is commonly sorted or classified. The biodegradable fractions are: paper and card; green waste; kitchen waste/putrescible; and miscellaneous combustibles. In England, municipal waste is estimated to have an average biodegradable content of 68%.	LBC is responsible for the management of this type of waste.
Commercial Waste*	Waste that comes from premises used wholly or mainly for trade, business, sport, recreation or entertainment (excluding household or industrial waste).	Private waste management companies. Arrangement may also be made with LBC at a pre-arranged cost for the collection of commercial waste.
Construction Waste	Waste arising from the construction, repair, maintenance and demolition of buildings and structures, including roads. It consists mostly of brick, concrete, hardcore, subsoil and topsoil, but it can also contain quantities of timber, metal, plastics and (occasionally) hazardous waste materials.	Household derived construction waste material is the responsibility of LBC although there is no statutory requirement to collect it. Where a collection is provided, a charge may be levied. Householders may be instructed to deposit such wastes at a Household Waste Recycling Centre. Construction waste derived from commercial sources will be managed by commercial waste operators.
Controlled Waste	Controlled waste encompasses household, industrial and commercial waste. Controlled wastes are defined in this way because they are controlled by legislation and as such, storage handling, transport and disposal methods must meet certain legal requirements.	LBC is responsible for the collection, treatment and disposal of municipal controlled waste. The Waste Producer should ensure that waste is collected by licensed and appropriate waste collectors. Commercial waste management companies for collection and disposal of commercial controlled waste.
Green Waste	Waste that is organic in nature and generated from horticultural and gardening activities including grass clippings, tree pruning and fallen leaves; this waste type does not include food waste.	Green waste from private land is the responsibility of the land owner; on public land and adopted roadways responsibility falls to LBC for removal.
Hazardous Waste*	Waste that exhibits properties which render the material dangerous to the environment and/or human health.	Services to receive such wastes must be provided at Civic Amenity sites (Household Waste Recycling Centres). A London wide collection scheme, for domestic hazardous waste, is provided by City of London on behalf of all London Boroughs with the exception of Hillingdon. For all other hazardous waste it is the responsibility of the waste producer to arrange for collection and disposal.
Litter	Waste generated on streets and other open areas either deposited in collection receptacles (litter bins) or on the ground.	Under the EPA 1990 Waste Collection Authorities have a responsibility to prepare 'Litter Plans' that outline how they intend to deal with litter when it arises. All land for which LBC assumes responsibility will be graded and allocated a response time for dealing with litter. Litter falling on private land is the responsibility of the land owner.
Municipal Waste	Predominantly household waste plus other wastes collected by a waste collection authority or its contractors. Includes collection from municipal parks and gardens waste, beach cleansing waste and any commercial and industrial waste for which collection authority takes responsibility.	LBC is responsible for the management of this type of waste.
Mixed Dry Recyclate	Mixed dry recyclate is the term for a collection of solid waste materials that can be stored and collected in one bin. These materials include cardboard, paper, newspaper, plastic film, plastic bottles, steel and aluminium cans and can be derived from households or commercial properties. Depending on who is responsible for the collection of the mixed dry recyclate (local authority or private contractor) other materials may also be categorised under this term (e.g. glass).	Residential Mixed Dry Recyclate waste is the responsibility of LBC. Commercial Mixed Dry Recyclate waste is the responsibility of private waste companies.
Putrescible Waste	Waste that is organic in nature and comprises mainly of food, be it cooked or uncooked, from kitchens and other catering establishments. Food waste from food retailers is also classified as putrescible. The treatment of putrescible wastes must be in accordance with the Animal By-product Regulations.	Separately collected putrescible waste from households is the responsibility of LBC. Such waste from private or commercial sources the collection is the responsibility of the land owner.
Residual Waste	Residual waste is the remaining waste material after separate diversion of waste components though reduction, reuse, recycling, home composting and/or garden waste and food waste collections.	Residential residual waste is the responsibility of LBC. Commercial residual waste is the responsibility of private waste companies.
Waste Electronic and Electrical Equipment (WEEE)	WEEE must be managed and collected and disposed of in line with the WEEE Regulations.	Household derived material is the responsibility of the producer. However, Councils normally arrange for collection for which a charge may be levied. Waste from commercial sources is the responsibility of the waste producer.

* Included for completeness. Volumes generated are likely to be negligible.

The Proposed Development

9.33 The Proposed Development will provide a residential OSD scheme totalling approximately 1814.2m^2 Gross Internal Area (GIA) of floor space and comprising of 22 residential units. Further details on the key components of the scheme are outlined below and provided in detail in Chapter 5 (The Proposed Development) of this ES.

Construction Phase

9.34 According to the construction programme set out within Chapter 6 (Construction) of this ES, construction will be a staged process taking place over approximately 30 months. The Proposed Development will involve the construction of an eight storey residential OSD built over a Crossrail intervention shaft and head house. The construction programme will be designed to minimise disruption to local residents, the general public and the environment.

9.35 The developer will inherit the site following completion of the Crossrail intervention shaft works ready for construction of the OSD. Consequently, all foundations and piling associated with the development will have been completed during the construction of the intervention shaft and head house associated with the Crossrail works. As such there will be no groundwork associated with the construction of the Proposed Development, minimising the production of waste usually associated with this phase of a project.

9.36 In-line with the SWMP Regulations, the Proposed Development will require a SWMP identifying the types and quantities of waste that will be produced during the construction phase. The SWMP will be produced by the principal contractor prior to the commencement of any on-site work. The principal contractor will have responsibility for writing, implementing and updating the SWMP throughout the development process. The SWMP will identify all waste streams and will discuss the potential to reduce, re-use and recycle all

materials wherever possible. In accordance with the principles of the UK Governments Waste Strategy for England 2009 commitment to waste minimisation will be achieved in a number of ways including, but not limited to, the following:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;
- Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled on-site for long periods of time, which increases the risk of their damage and disposal as waste;
- Attention to material quantity requirements to avoid over-ordering and generation of wasted materials;
- Segregation of waste at source where practical; and
- Re-use and recycling of materials off-site and where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).

9.37 Waste will only be disposed of at authorised waste treatment and disposal sites, in accordance with the requirements of the legislation and planning policy documents as listed in paragraph 9.3 of this ES. All waste will be classified in accordance with the Hazardous Waste Regulations 2009 and the site will be registered with the Environment Agency. Where space permits on-site, and as a minimum, waste will be segregated into labelled and colour coded containers for active, inert, compactable, plasterboard, metals and hazardous waste. Where space does not permit site segregation waste will be taken to a licensed transfer/handling station where it will be processed. All hazardous materials including chemicals, cleaning agents, solvents and solvent containing products will be properly sealed in containers at the end of each day, prior to storage in appropriately protected and bunded storage areas.

9.38 Construction contractors will be constantly monitored to ensure that the proportion of materials being recycled is maximised wherever possible. The principal contractor will ensure that the disposal of all waste and other materials removed from the site is in accordance with the requirements of the Environment Agency, legislation and planning policy documents as listed in paragraph 9.3 of this ES Chapter.

9.39 As part of the SWMP, the principal contractor will provide proof that all site waste has been deposited or transferred to the correct place and by appropriately licensed contractors. Records will also be kept and updated regularly ensuring that all waste transferred or disposed of has been correctly processed with evidence of signed waste transfer notes that will be kept on-site for inspection whenever requested.

9.40 A docket system will also be operated on-site to prove that correct procedures have been followed for the depositing of all site waste, including deconstruction arisings and the prevention of 'fly' tipping. The trade contractors will operate a sequentially numbered system, to confirm that each load is received at the approved disposal site. Copies of the dockets will be provided to the nominated manager and be available for inspection at the site. In addition, direct routes via main roads to designated waste recycling/disposal facilities will be agreed with the trade contractors.

Site Preparation, Excavation and Foundations

9.41 The Proposed Development is not expected to have a demolition phase or require excavation of basements as the development will be built over the existing Crossrail head house. Consequently, there will be no arisings of demolition and excavation materials from the Proposed Development. However, some site preparation works are expected to take place prior to construction activities due to breakout of existing concrete piles and removal of temporary cladding and structures. In total, these activities are expected to generate approximately 628m^2 of excavation materials. As there will be minimal opportunity for onsite re-use of materials from this phase of the development works, the use of re-used and recycled materials from other sources will be a main focus for the project. In addition, as the Proposed Development is designed to be based on a concrete frame, it is possible to incorporate recycled materials into the design by specifying concrete with high pulverised fuel ash or ground granulated blast-furnace slag content. This will act to further enhance re-use opportunities during the construction phase of the Proposed Development.

Construction

9.42 Throughout the construction phases of the Proposed Development, pre-assembly and pre-fabrication of construction materials will be prioritised wherever practicable to minimise on-site generation of waste and packaging. The principal contractor will undertake various measures to reduce site generated matter on roads and footpath. This will include the provision of suitable facilities at the site gates, wheel washing facilities and the use of a mechanical road sweeper/cleaner. Collected debris will be classified as controlled waste and disposed of in accordance with the Environmental Protection (Duty of Care) (England) (Amendment) Regulations 2003 at a licensed waste disposal facility. Table 9-5 outlines the estimated quantities of material that will be used throughout the construction period for the Proposed Development.

Table 9-5 Estimated Quantities of Construction Materials

Materials	Approximate Construction Quantities for Proposed Development (m^2)
Concrete surfaces	164
Reinforced concrete walls	2,670
Reinforced concrete flat slab construction	2,466
Reinforced concrete suspended slab construction	356
Roof installation	815
Lift and conveyor installations	4,718
External walls, cavity construction and cladding	3,000
Internal walls and partitions	2,595
Windows, glazing and external doors	816
Wall, floor and ceiling finishes	19,354
Plant, utilities and services	21,748
Fixtures and fittings	4,064
Hard landscaping	27

Operational Waste

Waste Generation

9.43 The Proposed Development's waste strategy has the following aims:

- To contribute towards achieving current and long-term Government, GLA and the LBC's targets for waste minimisation, recycling and re-use;
- To ensure that all legal requirements for handling operational waste management are complied with;
- To achieve high standards of environmental performance and, due consideration has and will continue to be given to the waste generated by the buildings during construction and operation; and
- To provide residents with convenient, clean and efficient waste systems that enhances the operation of the buildings and promote high levels of recycling.

9.44 Provided below is a brief explanation of how waste has been calculated and a description of individual management techniques to be employed during the operation of the proposed residential development. The methodology for estimating the volumes of waste generated by the Proposed Development is detailed in Table 9-3 and paragraphs 9.30.

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Residential Waste Arisings

9.45 Residential waste arisings of the Proposed Development have been calculated based on the number of bedrooms per unit, in accordance with guidance provided by LBC as part of CPG 1: Design (see Table 9-3). Table 9-6 summarises the total estimates of residential waste produced by the Proposed Development. It also provides a breakdown of both weekly and daily waste arisings which form the basis for calculating the storage capacity as required by LBC for communal stores within residential developments.

Table 9-6 Waste composition from the Proposed Development

Unit Type	No. of units	Volume of waste/week (L)	Volume of waste/day (L)
1 bedroom	5	750	107
2 bedrooms	14	2,800	400
3 bedrooms	2	500	72
4 bedrooms	1	300	43
Total	**22**	**4,350**	**622**

Storage and Management Strategy

Residential Waste Storage

9.46 Residents will be expected to separate their waste at source into three designated waste streams:

- Mixed dry recyclate (including paper card, plastic bottles, cans and glass);
- Residual waste; and
- Organic (kitchen) waste.

9.47 Following consultation with the LBC, and in-line with LBC requirements, it was determined that:

- Residual waste will be collected twice weekly with an allocation of four days storage capacity;
- Dry mixed recyclables will be collected on a weekly basis and a storage capacity of seven days will be provided; and
- Organic food waste will be collected weekly with a seven day storage capacity.

9.48 After separation, residents will be required to take their waste to the refuse store located at the ground floor where it will be stored in either 1,280L Eurobins (for residual waste and mixed dry recyclate) or 500L Eurobins (for organic waste). The Proposed Development's residential composition and storage requirements are outlined in Table 9-7.

9.49 Following consultation with the LBC it was determined that residual waste will account for 50% of total weekly waste arisings. In turn, mixed dry recyclables will account for 37.5% and organic food waste will make up the remaining 12.5% of waste produced by the Proposed Development. In total the Proposed Development is expected to produce 2,175L of residual waste, 1,631L of mixed dry recyclables and 544L of organic kitchen waste per week.

Table 9-7 Waste composition from the Proposed Development

Waste Component	Proportion (%)	Volume of waste/week (L)	Volume of waste/day (L)	Minimum Storage Capacity (L)	No. of Euro bins
Residual	50	2,175	311	1,244	1 x 1,280L
Mixed Dry Recyclables	37.5	1,631	233	1,631	2 x 1,280L
Organic (kitchen)	12.5	544	78	544	2 x 500L
Total	**100**	**4,350**	**622**	**3,419**	**3 x 1,280L 2 x 500L**

9.50 Storage requirements for residual waste and mixed dry recyclables have been designed to be flexible to allow for changing targets and policies. As such, whilst mixed dry recyclables are currently set at 37.5% of the total waste stream, there is scope for this to increase to +50% with an associated decrease in residual waste from 50% to <37.5% as recycling rates increase.

9.51 To comply with requirements of the LBC, each residential dwelling will be provided with enough internal storage capacity for a 30L bin for mixed dry recyclables and a 7L kitchen caddy for organic waste.

9.52 In total the bin store will provide three 1,280L Euro bins for the storage of residual and mixed dry recyclables, and two 500L Euro bins for the storage of organic food waste. Furthermore, the bin store incorporates sufficient space to allow for additional bins to be included should collection frequencies, recycling targets or policies change in the future.

Waste Storage Room Requirements

9.53 In line with BS5906: 2005, Part H6 of the Building Regulations (Ref. 9-38) and LBC guidance, the following will be designed into the Proposed Development to ensure that all mandatory waste storage requirements are complied with:

- There will be a space of 150 millimeters (mm) between each bin and wall;
- The entrance of the waste room will be free from steps and projections;
- Storage areas for waste and recyclable material will be clearly designated for this use only, by a suitable door or wall sign and, where appropriate, with floor markings;
- The walls and roofs of the waste room will be formed of non-combustible and impervious material and have a fire resistance;
- The waste room will have adequate lighting, proper ventilation and wash down facilities (waste pipe and drainage);
- Gullies will be positioned so as not to be in the track of container trolley wheels;
- Headroom in the waste rooms will have a minimum clearance of 2.6 metres (m);
- All bins will be accessible in the bin store;
- The storage facilities will not block any utility service point;
- The route between the storage area and collection point will be wide enough to allow bins to pass through easily and does not involve being taken through a building; and
- The store will contain instructional signage detailing correct use of facilities.

Unique Waste Management

9.54 It is likely that a small component of the overall waste arisings from the Proposed Development will consist of other waste streams including WEEE, printer and toner cartridges and fluorescent light tubes. In addition, building maintenance works have the potential to yield materials such as, paints and waste lubricating oils that will require separate storage in dedicated sealed containers. This type of waste is referred to as "unique waste" as it is not produced on a regular basis and consequently, its management will be on special

arrangement with a registered waste handler for that specific waste. Separate arrangements will be made for the storage and safe disposal of these waste streams as covered by the Hazardous Waste Regulations and WEEE Regulations. All waste management will comply with the Environmental Protection (Duty of Care) Regulations 2003 and provisions for the safe separation and storage of these wastes will be provided within the Proposed Development.

Bulky Waste

9.55 After consultation with the Environmental Services Officer at LBC, it was agreed that space for bulky waste will be provided in-line with best practice guidance within the communal bin store at ground floor level. Further space is also provided in the bicycle store should this be needed for temporary bulk waste storage by residents of the Proposed Development. Such items will then be collected in accordance with arrangements made by the individual resident with the appropriate waste carrier.

Maintenance and Fit out

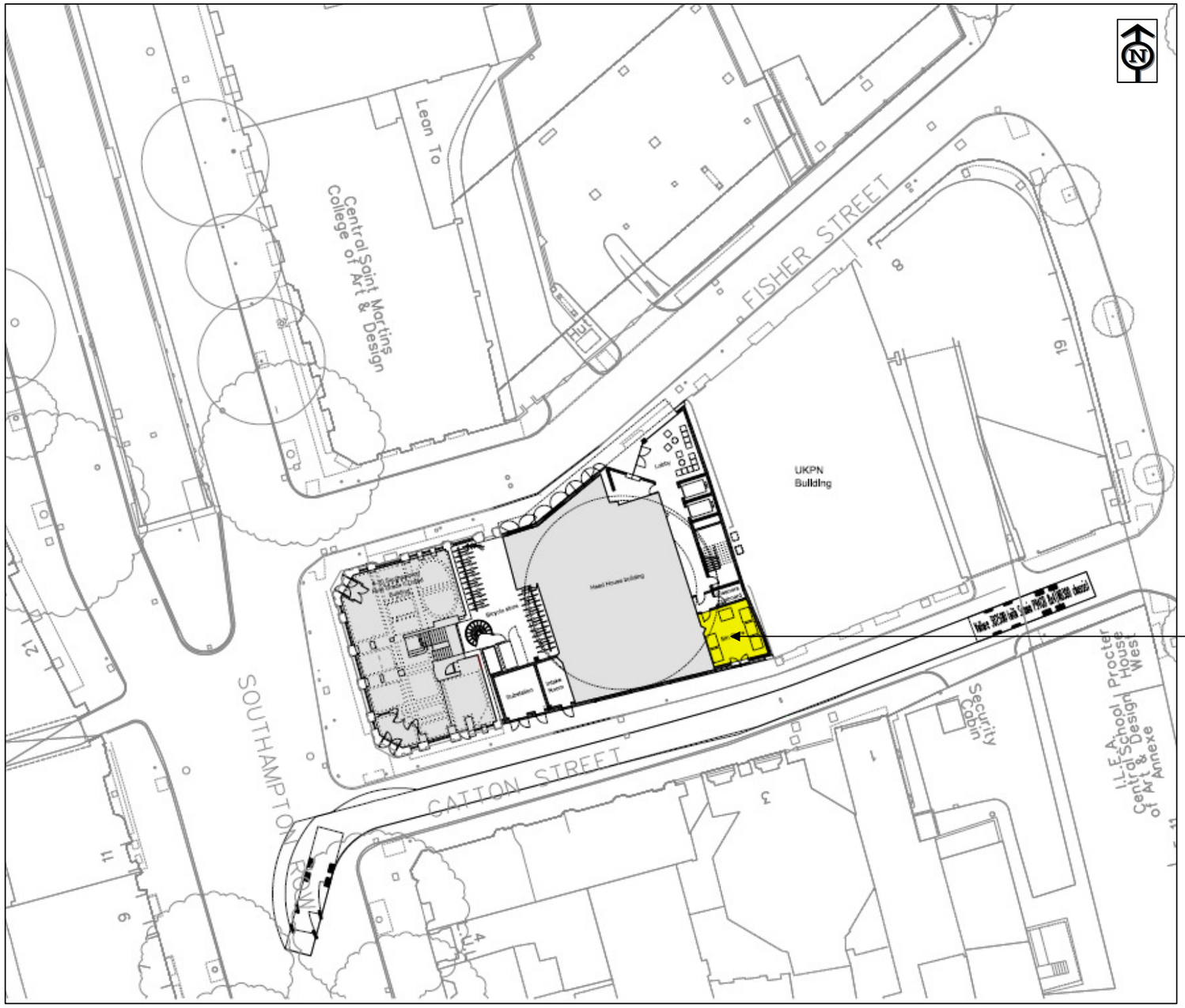
9.56 There will be sufficient space within the bin store located on the ground floor of the Proposed Development for the storage of waste arising from future maintenance activities. Arrangement for managing such waste arisings will be incorporated into the overall servicing strategy for the Proposed Development to ensure nuisance to the other residents and the local road network is kept to a minimum.

Servicing and Collection

9.57 The refuse collection team will have direct access to the bin store via Catton Street. On the day of collection, refuse vehicles will travel along Catton Street (from Southampton Row to Procter Street) and stop along the kerbside by the bin store for collection, as shown by Figure 9-1. Due to the width and limited use of Catton Street by other vehicles, small scale of the Proposed Development, collection frequencies of separate waste streams and co-mingled collection of recyclables, it is expected that total servicing times will be very short and cause minimal disruption to the local road network and residents.

09 Waste and Recycling

Figure 9-1 Ground Floor Plan



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Collection Requirements

9.58 In line with BS5906:2005, Part H6 of the Building Regulation and LBC guidance, the following will be designed into the Proposed Development to ensure that all mandatory waste storage requirements are complied with:

- All vehicle access roads that the waste collection vehicles will be required to use will be constructed to withstand a gross vehicle weight of 26 tonnes and axle loading of 11.5 tonnes. Any manhole covers or gratings situated in these access roads will also be capable of withstanding these loads.
- Vehicles will be able to enter and exit the site in a forward gear with no need to reverse more than 12m. In circumstances where reversing is required, for maneuvering only, raised footpaths will be provided to protect pedestrians;
- All service routes for the collection of waste will be a minimum of 4.0m in width (external);
- There will not be any routes where wheeled bins are to be pushed that will have a gradient more than 1:14, or that include steps or kerbs;
- The distance between where a container is sited within the Proposed Development and the nearest practicable position that the waste collection vehicle can stop will not exceed 10m for a wheeled container and 15m for carried load (i.e. bags);
- Collection points, either incorporated into the building or roadside will be able to accommodate LBC largest refuse vehicle. The specifications of this vehicle are:
  - Width; 3.0m;
  - Maximum Height (working); 5.8m; and
  - Maximum Weight (when fully laden); 26 tonnes.
- The design and location of the collection points will be designed to minimise potential noise disruption to surrounding residents.

Offsite Pollution

9.59 Waste management activities have the potential to cause pollution via two predominant routes:

- Leachate generation as waste undergoes various degradation processes; and
- Gas liberation (including methane and hydrogen sulphide) due to biological activity under anaerobic conditions within landfill sites.

9.60 To minimise these pollution impacts, the following steps will be undertaken:

- Only appropriately licensed waste carriers will be used in accordance with the Duty of Care Regulations 2003;
- The contractor responsible for waste transport and disposal will be required to provide confirmation that the receiving facility is permitted under both the Environmental Permitting (England and Wales) Regulations 2012 and the Pollution Prevention and Control Regulations 2000 (Ref. 9-39). This will act to ensure that appropriate controls are in place to monitor and control pollution from waste transport disposal; and
- Where possible, the waste management contractor will manage waste in accordance with the waste hierarchy, avoiding disposal of waste at landfill wherever feasible.

Summary and Conclusions

9.61 Once operational, the Proposed Development aims to be a sustainable development with high standards of environmental performance. As such, due consideration has and will continue to be given to the waste generated during its operation. Waste management within the Proposed Development has the following aims:

- To contribute towards achieving current and long-term Government, GLA and the LBC's targets for waste minimisation, recycling and re-use;
- To ensure that all legal requirements for handling operational waste management are complied with;
- To achieve high standards of environmental performance and, due consideration has and will continue to be given to the waste generated by the buildings during construction and operation; and
- To provide residents with convenient, clean and efficient waste systems that enhances the operation of the buildings and promote high levels of recycling.

9.62 In line with the LBC's Waste Storage Requirements for Developers of Commercial and Residential Properties, the Proposed Development is predicted to produce approximately 4,350L of waste per week. Of this total, 1,631L of mixed dry recyclables, 544L of organic kitchen waste and 2,175L of residual waste are expected to be generated from the residential units per week.

9.63 Following correspondence with LBC, it was determined that both mixed dry recyclables and organic food waste will be collected on a weekly basis and require seven days worth of storage provision. Residual waste will undergo twice weekly collection and require four days worth of storage capacity. Therefore, the Proposed Development will require a storage capacity of approximately, 1,631L for mixed dry recyclables, 544L for organic waste and 1,244L for residual waste.

9.64 Residents will be required to transport waste to the communal ground-floor level bin store where it will be stored in the corresponding bin for each waste stream; three 1,280L Euro bins will be used to store residual and mixed dry recyclables with organic food waste stored in two 500L Eurobins.

9.65 The bin store will incorporate space for the storage of bulky items including white goods and furniture. Arrangements for the collection of this waste will be made with the LBC or private waste contractor by the resident.

9.66 These provisions will ensure that waste produced from all elements and phases of the Proposed Development is handled in accordance with The Environmental Protection (Duty of Care) (England) (Amendment) Regulations 2003 at all times. All waste infrastructure introduced to the Proposed Development will comply with Building Regulations Part H6, British Standard BS5906: 2005 and the Charted Institute of Building Services Engineers (CIBSE) Guide G (Ref. 6-40) and the requirements of the Duty of Care Regulations 2003.

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