Sustainable Waste Management Plan

Hillingdon Hospital Masterplan

The Hillingdon Hospital Trust

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Quality information

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Table of Contents

1. Executive Summary 6
1.1 Operation 6
1.2 Construction 6
2. Introduction 8
3. The Proposed Development 9
4. Legislation and Planning Policy 9
4.1 National Waste Legislation 9
4.1.1 Waste and Planning Policy 9
5. Operational Waste and Recycling Management Strategy 12
5.1 Methodology 12
5.1.1 Detailed Elements 12
5.1.2 Outline Application 14
5.2 Storage Requirements and Waste Strategy 14
5.2.1 Detailed Application 14
5.2.2 Outline Application 17
5.3 Existing Hillingdon Hospital Incinerator 18
6. Outline Construction Resource Management Plan 20
6.1 Introduction 20
6.1.1 Requirements for a CRMP 20
6.2 Construction, Demolition and Excavation Waste 20
6.2.1 Methodology 20
6.2.2 Anticipated Construction, Demolition Waste and Surplus Excavated Materials Quantities 21
6.3 Site Waste Management Plan 22
6.3.1 Waste Hierarchy 22
6.3.2 Site Waste Management Measures 24
6.3.3 Waste Duty of Care 27
6.3.4 Waste Carriers 27
6.3.5 Waste Documentation 27
6.3.6 Waste Transfer Note (Non-Hazardous Waste) 27
6.3.7 Waste Consignment Note (Hazardous Waste) 28
6.3.8 Fly-Tipping 28
6.4 Reporting, Monitoring and Auditing 28
6.4.1 Review of the Detailed CRMP – Monitoring Record 29
6.4.2 Site Inspection 29
6.4.3 Closure Reporting 29
Appendix A - Waste Carrier Record (Template) 31
Appendix B – Waste Management Tracker (Template) 32

Figures

Figure 5-1: Colour Coding of Healthcare Waste 13
Figure 5-2: External Waste Transfer Area 16
Figure 5-3: Vehicle Access to Waste Storage Yard 17
Figure 5-4: Indicative Location of Servicing Routes – Outline Application 18
Figure 6-1: Waste Hierarchy 23

Tables

Table 4-1. National, Regional and Local Waste and Planning Policies Relevant to the Proposed Development . 10
Table 5-1. Residential Waste Arisings Methodology 14
Table 5-2. Commercial Waste Arisings Methodology 14
Table 5-3. Container Type for Recycling and Waste Stream 14
Table 5-4. Storage Requirements and Collection Frequency. 15
Table 5-5: Estimated Waste Quantities (tonnes per annum) 15
Table 5-6: Residential Waste Generation 17
Table 5-7: Commercial Waste Generation 17
Table 6-1: Average Waste (In Tonnes) per 100 m2 of GEA 20
Table 6-2: Estimated Construction Waste Generation 21
Table 6-3: Estimated Demolition Waste 22
Table 6-4: Recommended On-Site Waste Management Measures to Adhere to the Waste Hierarchy 25
Table 6-5: Summary of Recommended Best Practice On-Site Waste Management Measures 26

1. Executive Summary

This Sustainable Waste Management Plan (SWMP) has been prepared for the Hillingdon Hospital Masterplan and includes both an Operational Waste and Recycling Management Strategy and a Construction Resource Management Plan (CRMP).

1.1 Operation

During Operation, waste from the new Hillingdon Hospital will be segregated in accordance with the guidance set out in publication HTM 07-01 (Management of Healthcare Waste). Waste receptacles of a suitable type and correctly colour-coded (e.g. rigid containers for sharps.) will be used for internal collection of all waste streams.

Waste will move internally within the Proposed Development, starting within individual wards and ending with the external waste yard. Staff will dispose of waste close to the point of generation into small corridor bins within their individual department. Cleaning staff will collect the waste from these bins and transfer them to the department disposal rooms.

When the bins located inside the disposal room are full, cleaning staff will transport them to the dedicated FM lifts, which are located adjacent to the main corridor on each floor, and replace them with an empty bin. Full waste bins will be transported via the FM lifts to the basement level, where they will be taken to the southern end of the main corridor and transported via the FM lifts to the ground level service yard. A ramp is also available should the FM lifts be out of order. All waste will be transferred to the external waste yard where it will be collected.

Waste will be collected directly from the external service yard by the waste contractor's vehicles, from where they will be taken off site for management at a suitably permitted facility. Full containers that are taken off site will be replaced by empty containers.

An existing incinerator is located approximately 200 m north of The Hillingdon Hospital Redevelopment site. The incinerator is currently out of operation. Refurbishment of the incinerator is underway to extend the life of the clinical waste incinerator at the Hillingdon Hospital site. Recommissioning the plant started in July 2021. It is likely that the works will be completed around June 2022. The incinerator will continue to support the existing hospital for the duration of its remaining operation (approximately 7-10 years). The incinerator repair/refurbishment does not form part of this planning application. The incinerator will be decommissioned when the decant of the existing hospital buildings is complete.

For the Outline elements of the Application, the detailed locations of bin stores have not been determined at this stage, but will be located such that they comply with the requirements to be:

- No more than 30m horizontal distance from each individual property;
- Requires waste collection operatives to move bins no more than 10m from the presentation point to the collection vehicle.

Separate provision will be made for residential and commercial bin storage.

1.2 Construction

This SWMP includes an Outline CRMP which demonstrates how the Site has taken into account sustainable methods for managing construction, demolition and excavation (CD&E) material during the CD&E phases of the Site.

The CRMP provides a review of the requirements placed upon the Site under legislation and implemented policy at all levels of government (i.e. national (England), and local (LBH)).

Initial estimates of the quantities of construction waste likely to be generated during the construction phase have been calculated based on the total Gross External Area (GEA) of the land use class within the Proposed Development. Demolition waste arisings have been estimated as part of the pre-demolition audit, and the estimated quantity of surplus excavated material have been provided by the Civil Engineers.

The total quantity of waste anticipated to be generated from construction of the Proposed Development is approximately 21,095 tonnes. The estimated quantities of demolition waste are 26,386 tonnes. The preliminary earthworks assessment carried out by the civil engineering team estimates that approximately 60,000 tonnes of surplus excavated material will require removal from the Site.

The CRMP details the likely waste management measures and procedures to be implemented on Site during the CD&E phases in accordance with the Waste Hierarchy. The CRMP also sets out measures to minimise waste generation and to effectively manage waste on the Site.

2. Introduction

This Sustainable Waste Management Plan has been prepared by AECOM to accompany a hybrid planning application being submitted by the Applicant, Hillingdon Hospitals NHS Foundation Trust, to the London Borough of Hillingdon.

This SWMP contains information on the waste and recyclate management practises for both operational and construction phases related to the Site only and has been divided into two sections:

- Operational Waste and Recycling Management Strategy (hereafter referred to as the 'Strategy'); and
- Outline Construction Resource Management Plan (hereafter referred to as the 'CRMP')

The principle aim of the Strategy is to demonstrate how sustainable methods for waste and recycling management have been taken into account for the operational phase of the Site (i.e. both detailed and outline elements of the planning application). Furthermore, with regards to waste and recycling management within the Site, the Strategy has the following aims:

- To contribute towards achieving current and long-term national and LBH targets for waste minimisation, recycling and re-use;
- To comply with all applicable legal requirements for handling operational waste;
- To achieve high standards of waste management performance, through giving due consideration to the waste generated during operation of the Site; and
- To provide a convenient, clean and efficient waste management strategy that enhances the operation of the Site and promotes recycling.

The principle aim of the Outline CRMP is to demonstrate how the Site has taken into account sustainable methods for managing construction, demolition and excavation (CD&E) material during the detailed CD&E phases of the Site (i.e. both detail and outline elements of the planning application). Furthermore, with regards to managing CD&E material associated with the Site, this CRMP has the following aims:

- To contribute towards achieving emerging, current and long-term national, regional and LBH targets for waste for waste minimisation, recycling and reuse of CD&E material arisings and materials;
- To provide a summary of the CD&E works to provide context of anticipated waste and material arisings and management;
- To facilitate the contractor to comply with all applicable legal requirements for handling CD&E material; and
- To facilitate the contractor to achieve high standards of waste management performance.

The SWMP will result in waste being produced during the operational and CD&E phases of the Site to be managed in accordance with the Waste (England and Wales) Regulations, 2011 (as amended). Additionally, all waste infrastructure introduced to the Site will comply with guidelines published by London Borough of Hillingdon, British Standard (BS) 5906:2005 "Waste Management in Buildings Code of Practice" and Part H6 of the Building Regulations (2010).

This SWMP acknowledges that anyone producing, handling and carrying waste on the Site, and to and from the Site will do so in accordance with the Duty of Care Code of Practice, 2018 (as amended). In relation to this SWMP, Waste is defined as per the Waste Framework Directive (2008/98/EC) as "any substance or object which the holder discards or intends or is required to discard".

3. The Proposed Development

The Proposed Development comprises a hybrid planning application:

1. FULL application seeking planning permission for demolition of existing buildings and redevelopment of the site to provide the new Hillingdon Hospital, multi-storey car park and mobility hub, vehicle access, highways works, associated plant, generators, substation, new internal roads, landscaping and public open space, utilities, servicing area, surface car park/ expansion space, and other works incidental to the proposed development.

2. OUTLINE planning application (all matters reserved, except for access) for the demolition of buildings and structures on the remaining site (excluding the Grade II Furze and Tudor Centre) for a mixed-use development comprising residential (Class C3) and supporting Commercial, Business and Service uses (Class E), new pedestrian and vehicular access; public realm, amenity space, car and cycling parking.

The Outline application comprises up to 327 residential units and (Use Class C3) and up to 800 sqm of town centre uses (Use Class E) in a series of buildings ranging in height from 3 up to 8 storeys with associated access and car parking for up to 302 vehicles and up to 515 cycle parking spaces, refuse storage, landscape and amenity areas and associated servicing.

4. Legislation and Planning Policy

A summary of national and local planning policy relevant to the Site (for both the operational and construction phases) is provided in this section. It should be noted that this summary identifies those elements of the policy or guidance applicable to waste management within the Site and does not provide a comprehensive overview of the relevant legislation or policy as a whole.

4.1 National Waste Legislation

Waste legislation relevant to the Site includes:

- The Animal By-Products (England) Regulations 2009 (as amended 2015);
- Clean Neighbourhoods and Environment Act 2005 (as amended 2015);
- Control of Pollution Act (COPA) 1974 (as amended 1989);
- The Controlled Waste (England and Wales) Regulations 2012 (as amended 2012);
- The Environment Act 1995;
- Environmental Protection Act 1990 (EPA);
- The Landfill Tax Regulations 1996 (as amended 2017);
- The List of Wastes (England) Regulations (as amended 2005);
- The Pollution Prevention and Control (Fees) (Miscellaneous Amendments) Regulations 2017;
- The Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (as amended 2017);
- The Hazardous Waste Regulations 2005 (as amended 2016);
- The Waste (England and Wales) Regulations 2014 (as amended);
- The Waste Batteries and Accumulators Regulations 2009 (as amended 2015) ;
- The Waste Electrical and Electronic Equipment (WEEE) Regulations 2015;
- The Waste Management (England and Wale) Regulations 2011;
- Health Technical Memorandum HTM 07-01: safe management of healthcare waste

4.1.1 Waste and Planning Policy

The national, regional and local waste and planning policies in Table 4-1 contain information applicable to the Proposed Development.

Table 4-1. National, Regional and Local Waste and Planning Policies Relevant to the Proposed Development

Waste/Planning Policy Document	Date	Policy	Detail
A Green Future: Our 25 Year Plan to Improve the Environment	2018	Chapter 4: Increasing resource efficiency and reducing pollution and waste	Make sure that resources are used more efficiently and kept in use for longer to minimise waste and reduce its environmental impacts by promoting reuse, remanufacturing and recycling. Work towards eliminating all avoidable waste by 2050 and all avoidable plastic waste by end of 2025 .
Our Waste, Our Resources: A Strategy for England	2018	1.1.1 2.3.1 3.1.1	Extended Producer Responsibility - The Extended Producer Responsibility (EPR) is "a policy approach through which a producer's responsibility for a product is extended to the post-use stage. This incentivises producers to design their products to make it easier for them to be reused, dismantled and/or recycled at end of life". Deposit Return Scheme - In a Deposit Return Scheme (DRS), a small deposit will be added to the price of a drink container brought to a store. Once the container has been used, the consumer will dispose of it in a reverse vending machine and the deposit will be returned to the consumer. Consistent Collections - Subject to consultation, legislation enforcing the government to "specify a core set of materials to be collected by all local authorities and waste operators" will be introduced. It is envisioned that specifying a consistent set of dry recyclable materials to be collected from all households and businesses will improve England's recycling rate, (subject to consultation) it will include mandatory separate food waste collections. At the current time these policy instruments are out for consultation and (subject to proposals) will be rolled out from 2023.
The London Plan, Spatial Development Strategy for Greater London	2016	Policy 5.3 Sustainable Design and Construction	States that the highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime. This should be achieved through a number of sustainable design principles, including minimising the generation of waste and maximising re-use and recycling.
The London Plan, Spatial Development Strategy for Greater London.	2016	Policy 5.16 Waste Net Self-sufficiency	States that the Mayor will work with various stakeholders and authorities to manage as much of London's waste within London as practicable, working towards managing the equivalent of 100% of London's waste within London by 2026, whilst also working towards zero biodegradable or recyclable waste sent to landfill. This should be achieved by a number of ways, including minimising waste, encouraging the reuse of materials, exceeding recycling/composting levels in local authority collected waste (LACW) and commercial and industrial waste, improving London's net self-sufficiency through reducing the proportion of waste exported from the capital over time, and working with neighbouring regional and district authorities to co-ordinate strategic waste management across the south east of England.
The London Plan	2021	Policy SI 7 Reducing Waste and Supporting the Circular Economy	Resource conservation, waste reduction, increases in material re-use and recycling, and reductions in waste going for disposal will be achieved by the Mayor, waste planning authorities and industry working in collaboration to: 1) promote a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible 2) encourage waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products 3) ensure that there is zero biodegradable or recyclable waste to landfill by 2026 4) meet or exceed the municipal waste recycling target of 65 per cent by 2030163 5) meet or exceed the targets for each of the following waste and material streams: a) construction and demolition – 95 per cent reuse/recycling/recovery b) excavation – 95 per cent beneficial use

			6) design developments with adequate, flexible, and easily accessible storage space and collection systems that support, as a minimum, the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass) and food.
London Environment Strategy	2018	Policy 7.2.2	Targets a 65% recycling rate for municipal waste (this is broken down into a 50% recycling target for household waste and a 75% target for business waste by 2030) and specifies that no biodegradable or recyclable waste will be sent to landfill by 2026.
West London Waste Plan	2015	Policy WLWP 6 – Sustainable Site Waste Management	To encourage sustainable waste management, waste management developments will be permitted where it can be demonstrated that: a. At least 10% of the materials or products used in the construction and operation of the development are re-used or recycled and sourced from within 100km from the site; b. Construction, demolition and excavation wastes are minimised and then reused or recycled on site, where practicable and environmentally acceptable; c. Site Waste Management Plans are comprehensive and capable of being delivered; and d. Where on-site management of waste is not possible, active consideration has been given to the transportation of construction, demolition and excavation wastes away from the site by modes other than road, principally by water and rail and this has been incorporated into the scheme or proven not to be practicable.

5. Operational Waste and Recycling Management Strategy

The principle aim of this Strategy is to demonstrate how sustainable methods for waste and recycling management have been taken into account for the operational phase of the Proposed Development. Furthermore, with regards to waste and recycling management within the Proposed Development, this Strategy has the following aims:

- To contribute towards achieving current and long-term national and LBH targets for waste minimisation, recycling and re-use;
- To comply with all applicable legal requirements for handling operational waste;
- To achieve high standards of waste management performance, through giving due consideration to the waste generated during operation of the Proposed Development; and
- To provide a convenient, clean and efficient waste management strategy that enhances the operation of the Proposed Development and promotes recycling.

5.1 Methodology

5.1.1 Detailed Elements

5.1.1.1 Site Visit

On the 4th December 2020, the AECOM waste team conducted a site visit to the currently operational Hillingdon Hospital.

The purpose of this site visit was to understand and discuss the current waste and recycling management practises adopted within the existing hospital including; storage, handling, internal management collection practices and disposal information.

Prior to the site visit, the AECOM team issued an initial questionnaire to the THH Sustainability Lead and Patient Transport and Waste Services Manager. This questionnaire provided an understanding of the waste management practises currently adopted on-site.

5.1.1.2 Waste Composition

Waste from the new Hillingdon Hospital will be segregated in accordance with HTM 07-01 into the following main categories:

- infectious waste;
- anatomical waste;
- medicinal waste;
- cytotoxic and cytostatic waste;
- sharps contaminated with cytotoxic/cytostatic products;
- sharps contaminated with other medicinal waste products;
- sharps which are potentially infectious;
- offensive/hygiene waste;
- domestic waste;
- amalgam waste;
- chemical waste (including laboratory, X-ray and photochemicals);
- radioactive waste;
- large equipment and mattresses;
- implanted/infectious medical devices.

Waste will be colour-coded using the system shown in Figure 5-1 below. Waste receptacles of a suitable type and correctly colour-coded (e.g. rigid containers for sharps.) will be used for internal collection of all waste streams.

Figure 5-1: Colour Coding of Healthcare Waste

Colour	Description
Yellow	**Waste which requires disposal by incineration** Indicative treatment/disposal required is **incineration** in a suitably permitted or licensed facility.
Orange	**Waste which may be "treated"** Indicative treatment/disposal required is to be "rendered safe" in a suitably permitted or licensed facility, **usually alternative treatment plants (ATPs). However this waste may also be disposed of by incineration**.
Purple	**Cytotoxic and cytostatic waste** Indicative treatment/disposal required is **incineration** in a suitably permitted or licensed facility.
Yellow/black	**Offensive/hygiene waste*** Indicative treatment/disposal required is **landfill** or municipal **incineration/energy from waste** at a suitably permitted or licensed facility.
Red	**Anatomical waste for incineration**[1] Indicative treatment/disposal required is **incineration** in a suitably permitted facility.
Black	**Domestic (municipal) waste** Minimum treatment/disposal required is **landfill**, municipal **incineration/energy from waste** or other municipal **waste treatment process** at a suitably permitted or licensed facility. Recyclable components should be removed through segregation. Clear/opaque receptacles may also be used for domestic waste.
Blue	**Medicinal waste for incineration**[1] Indicative treatment/disposal required is **incineration** in a suitably permitted facility.
white	**Amalgam waste** For **recovery**

Source: HTM07-01

5.1.2 Outline Application

For the purposes of this guide and to provide high-level waste and recycling arisings, it is assumed that all residential units will consist of two-bedrooms. The methodology in BS5906:2005 has been used to calculate the waste arisings per residential unit per week, as summarised in Table 5-1.

Table 5-1. Residential Waste Arisings Methodology

Waste Generation rate	Waste Stream Spit
(30L per dwelling + 70L per bedroom)	MDR : Residual 50:50

Table 5-2. Commercial Waste Arisings Methodology

Use	Weekly Waste Generation Rate	Waste Stream Spit
E(a) - Retail	75L/cover 1 cover per 3m^2 GIA	MDR : Food : Residual 50: 30: 20
E(b) - Food & beverage	10L/m^2 sales floor area Sales floor area = 0.67 x GIA	MDR : Residual 75 : 25

5.2 Storage Requirements and Waste Strategy

5.2.1 Detailed Application

The estimated external and internal bin storage requirements are based on the information provided within Appendix A and discussions held during the Site Visit. The external bin storage requirements consider both the proposed Hillingdon Hospital healthcare areas and associated catering facilities.

For the purposes of determining storage arrangements, clinical waste (e.g. offensive, sharps, hazardous and infectious waste) has been grouped together; this is because all of these waste streams are stored in 770L yellow wheeled bins. Healthcare waste collection allows for the distinction of each waste stream via a colour coded sack or other receptacle, which is then placed into a yellow bin designated for that particular colour coded sack. Each yellow bin is identifiable by healthcare waste stream via a visible tracking tag.

5.2.1.1 Internal Waste Storage

Clinical waste will be internally stored and transported in 770L yellow waste bins as shown in Table 5-3.

The non-clinical waste produced in the hospital will be segregated and internally stored and transported in 1100L or 120 L bins as shown in Table 5-3.

Table 5-3. Container Type for Recycling and Waste Stream

Material Type	Size of bin	Dimensions (height x width x depth)	Image
MDR Confidential waste Residual waste	1,100 L	1,370mm(H), 990mm (W), 1,260mm (D)	
Food waste	120 L	930mm (H), 480mm (W), 545mm (D)	

Clinical waste	770 L	1300mm x 1260mm x 765mm	

Note that dimensions provided are indicative and exact dimensions are dependent on the individual waste bin supplier.

5.2.1.2 Internal Waste Transfer

Waste will move internally within the Proposed Development, starting within individual wards and ending with the external waste yard.

Staff will dispose of waste close to the point of generation into small corridor bins within their individual department. Cleaning staff will collect the waste from these bins and transfer them to the department disposal rooms. Each department will be provided with at least one disposal room. It is anticipated that each disposal room will include:

- 2 x 770L clinical waste bins
- 1 x 1100L residual waste bin
- 1 x 1100L MDR bin

When the bins located inside the disposal room are full, cleaning staff will transport them to the dedicated FM lifts, which are located adjacent to the main corridor on each floor, and replace them with an empty bin.

Full waste bins will be transported via the FM lifts to the basement level, where they will be taken to the southern end of the main corridor and transported via the FM lifts to the ground level service yard. A ramp is also available should the FM lifts be out of order.

All waste will be transferred to the external waste yard where it will be collected.

5.2.1.3 External Waste Storage

Based on the discussions held with the Applicant during the Site Visit and subsequently, the number of external bins and their collection frequency required to serve the Hospital are shown in Table 5-4.

Table 5-4. Storage Requirements and Collection Frequency.

Waste Stream	Number of external containers	Collection Frequency
Clinical waste	70 x 770 L	Daily
Confidential paper	20 x 1,100 L	Once a week
Residual	1 x large compactor unit	Twice a week
Cardboard	30-yard lidded Ro-Ro	Once a week
Mixed Dry Recyclates (MDR)	20 x 1,100 L	Once a week
Waste electrical and electronic equipment	12-yard skip	Ad hoc
Metal	30-yard lidded Ro-Ro	Ad hoc
Maintenance and Fit out	12-yard skip	Ad hoc

The storage requirements allow for a pro-rata increase in waste quantities (based on bed numbers) which are expected to changes as shown in Table 5-5.

Table 5-5: Estimated Waste Quantities (tonnes per annum)

	Current (2019/20)	Future (following redevelopment)
Non-hazardous waste (residual & recycling)	949	1,043
Hazardous & offensive waste	486	534

In addition to waste containers, the waste yard will host an external office with WC for the internal management team (i.e. Hillingdon Hospital Staff team).

5.2.1.4 External Waste Collection

Once the full residual bins are taken to the external yard, they will be emptied into the compaction unit and returned as empty bins.

Bags and other receptacles containing clinical waste will be transferred into the yellow clinical waste bins.

Cardboard, metal and WEEE waste will be placed directly into the relevant skips.

Clinical waste and recyclable waste will be placed into the relevant 1100L bins in the waste yard.

Waste will be collected directly from the external service yard by the waste contractor's vehicles, from where they will be taken off site for management at a suitably permitted facility. Full containers that are taken off site will be replaced by empty containers.

The location of the external service yard and the vehicle access arrangements are shown in Figure 5-2. The vehicle access route to the external service yard is shown in Figure 5-3, and is via the main service road from Colham Green Road.

Figure 5-2: External Waste Transfer Area

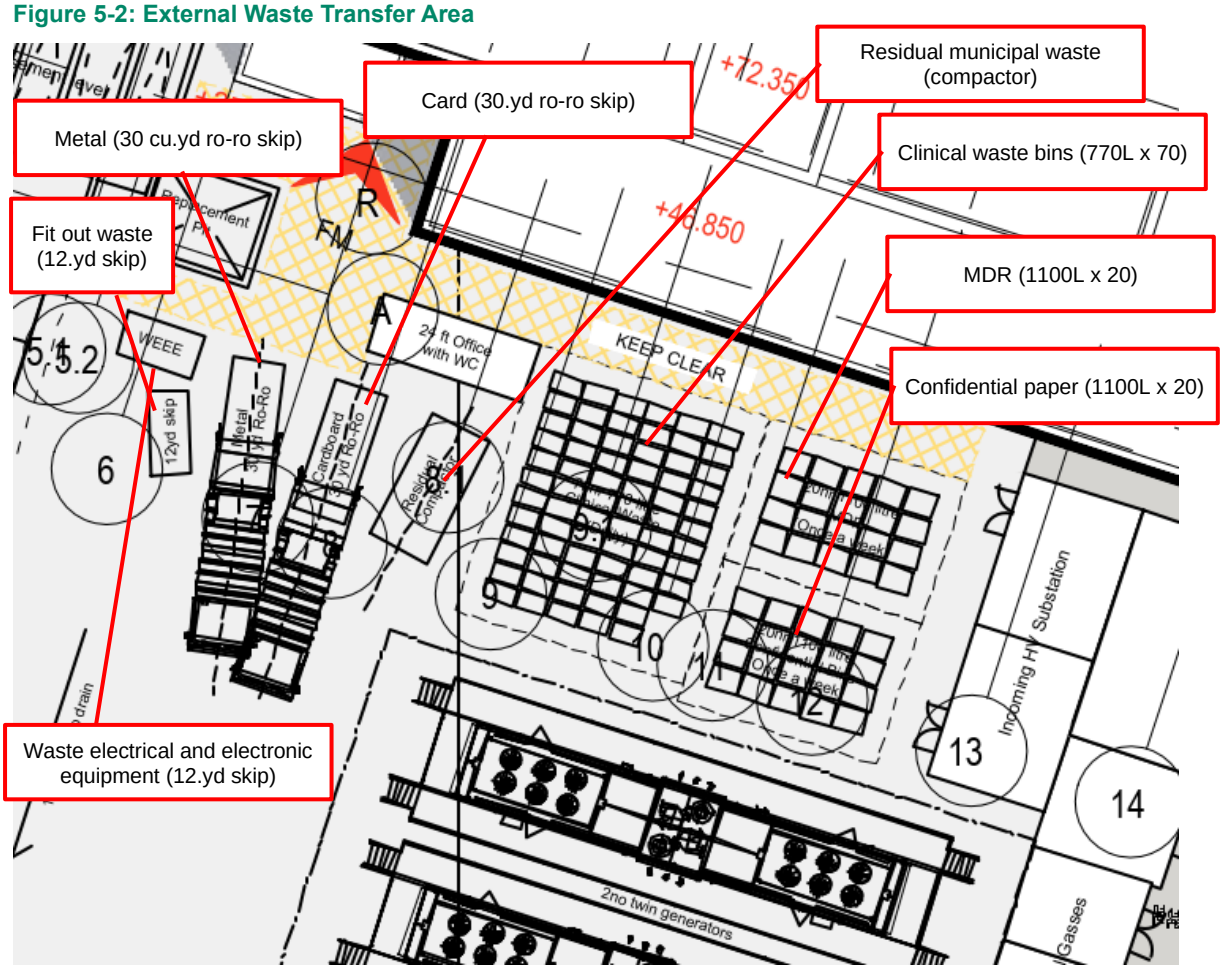
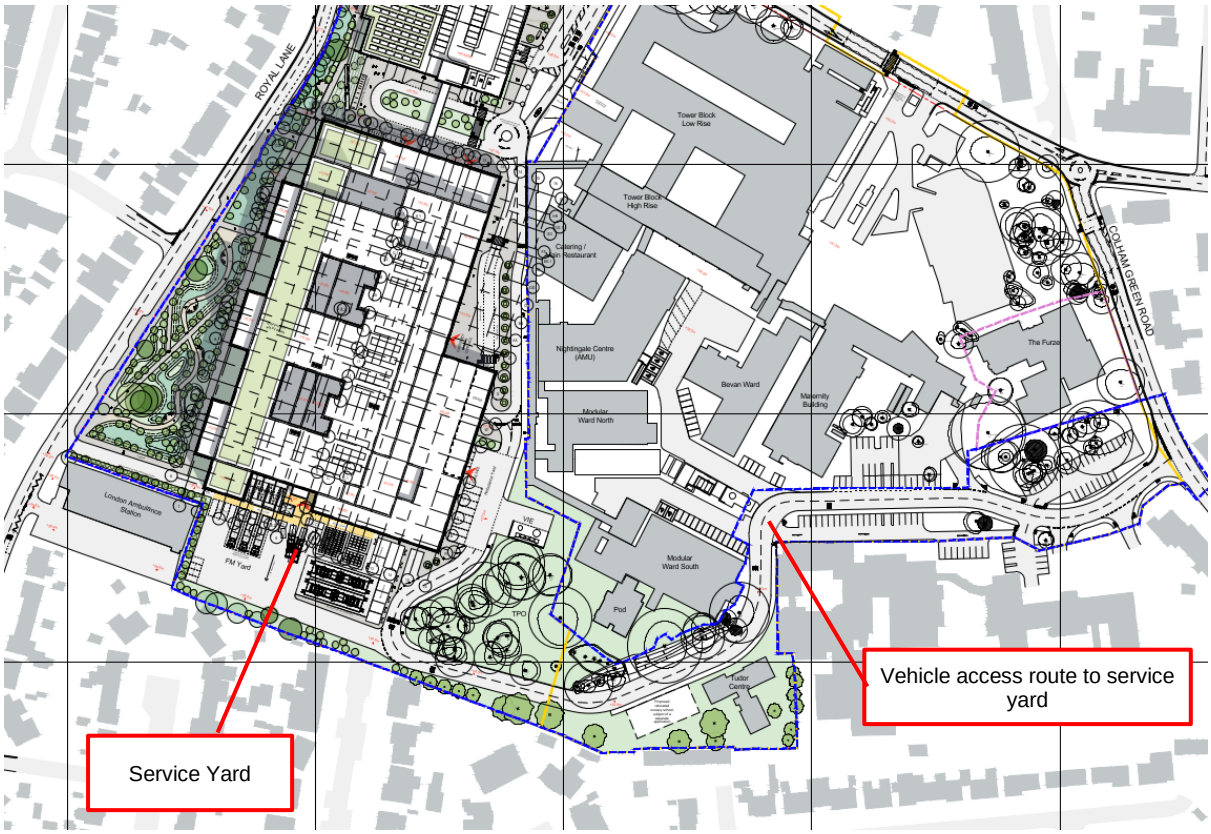


Figure 5-3: Vehicle Access to Waste Storage Yard



5.2.2 Outline Application

The Outline application is based on the following uses:

- 327 units consisting of 275 flats (95 one bed units; 118 two bed units and 62 three bed units) and 52 houses;
- 350 m^2 (including food and beverages); and
- 650 m^2 of retail.

The estimated waste arisings from the Outline Application is shown in Table 5-6 and Table 5-7.

Table 5-6: Residential Waste Generation

Units		Waste Generation Rate (L/unit/week)	MDR	Residual
1-bed	95	100		
2-bed	118	170		
3-bed	114	240		
TOTAL:	**327**		**28,460 L**	**28,460 L**

Table 5-7: Commercial Waste Generation

Use	NIS (m2)	MDR	Food waste	Residual
E(b) - Food & beverage	350	4,375	2,625	1,750
E(a) - Retail	650	4,875		1,625
TOTAL:		9,250	2,625	3,375

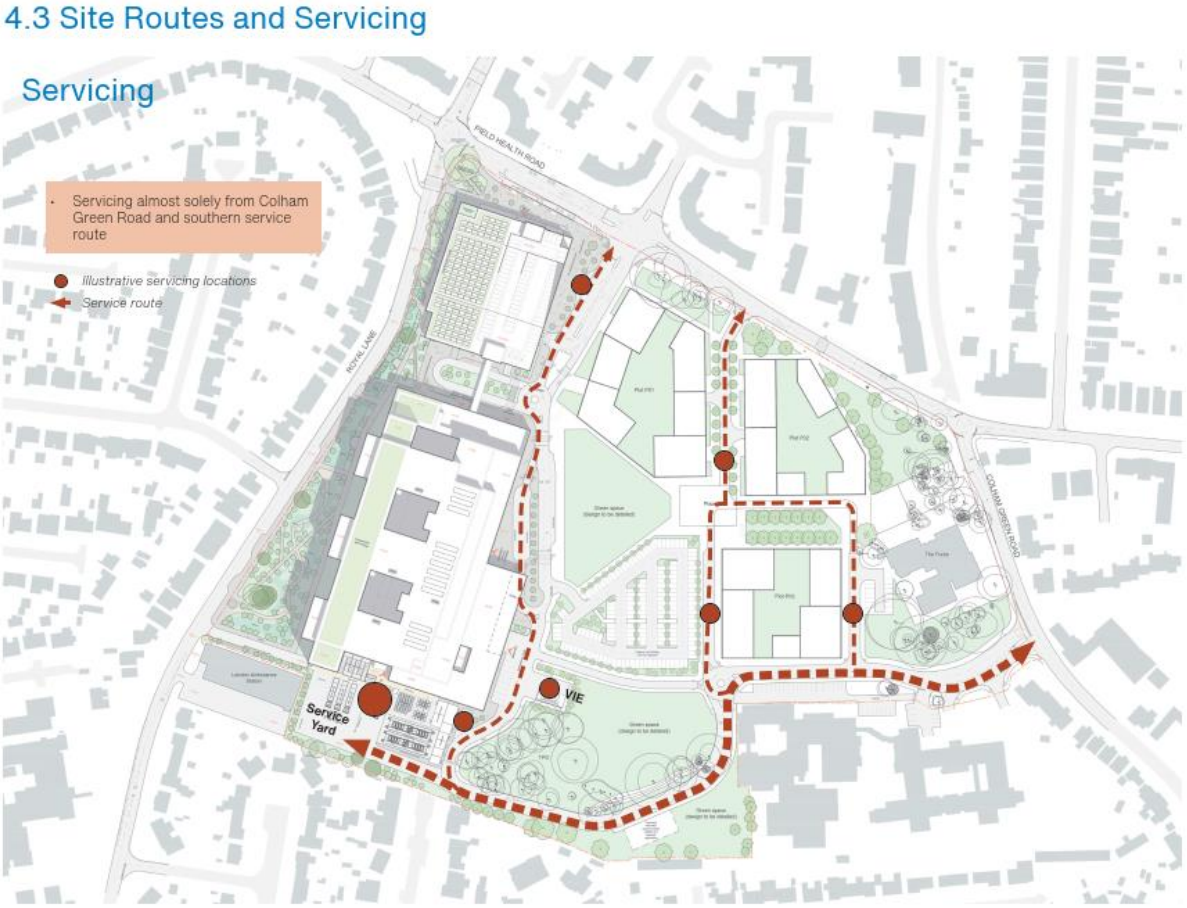
The detailed locations of bin stores have not been determined at this stage, but will be located such that they comply with the requirements to be:

- No more than 30m horizontal distance from each individual property;
- Requires waste collection operatives to move bins no more than 10m from the presentation point to the collection vehicle.

Separate provision will be made for residential and commercial bin storage. A bulky waste store must be provided for residents. It is recommended under best practice that a 7.5 m^2 area is provided per 75 residential units, with no store smaller than 7.5 m^2.

Indicative locations for collection vehicle access and servicing areas are shown in Figure 5-4. This will be developed during detailed design of Phase 2.

Figure 5-4: Indicative Location of Servicing Routes – Outline Application



5.3 Existing Hillingdon Hospital Incinerator

The existing incinerator is located approximately 200 m north of The Hillingdon Hospital Redevelopment site.

Following discussions with the Trust, it was confirmed that the incinerator is currently out of operation (since 2019) but previously supplied heat to the existing Hillingdon Hospital building (supplemented by gas boilers). At present, hospital waste is stored on-site in a waste yard and collected for treatment off-site. Even when the incinerator is operational, as it is not located geographically on the same site, the waste is stored on-site before being transported to the incinerator site.

Approximately 25-30% of the current hospital waste would be treated with the incinerator when it is operational. The remaining waste is non-clinical (domestic and other clinical waste requiring specialist facilities).

At present, the waste that was previously disposed of via the incinerator is typically sent to the Sidcup Facility (Queen Marys Hospital, Frognal Avenue, Sidcup, Kent, DA14 6LT), or on occasion to Larkfield (Bellingham Way, Aylesford, ME20 6SQ).

Refurbishment of the incinerator is underway to extend the life of the clinical waste incinerator at the Hillingdon Hospital site. Recommissioning the plant started in July 2021. It is likely that the works will be completed around June 2022. The incinerator will continue to support the existing hospital for the duration of its remaining operation (approximately 7-10 years).

THHR is likely to be completed in 2027 and the decant of the existing hospital buildings are likely to continue until approximately 2030. The incinerator repair/refurbishment does not form part of this planning application. Based on the timescales around the incinerator repair/refurbishment and the new hospital redevelopment/decant from existing hospital buildings, the new hospital redevelopment will not be connected to the incinerator. The incinerator will be decommissioned when the decant of the existing hospital buildings is complete.

6. Outline Construction Resource Management Plan

6.1 Introduction

The principle aim of this Outline CRMP is to demonstrate how the Site has taken into account sustainable methods for managing construction, demolition and excavation (CD&E) material during the detailed CD&E phases of the Site Furthermore, with regards to managing CD&E material associated with the Site, this CRMP has the following aims:

- To contribute towards achieving emerging, current and long-term government and LBH targets for waste for waste minimisation, recycling and reuse of CD&E material arisings and materials;
- To provide a summary of the CD&E works to provide context of anticipated waste and material arisings and management;
- To facilitate the contractor to comply with all applicable legal requirements for handling CD&E material; and
- To facilitate the contractor to achieve high standards of waste and management performance.

This CRMP provides a review of the requirements placed upon the Site under legislation and implemented policy at all levels of government (i.e. national (England), and local (LBH)).

For the purpose of this CRMP, waste is defined as per the Waste Framework Directive (WFD) (2008/98/EC) as “any substance or object which the holder discards or intends or is required to discard”.

6.1.1 Requirements for a CRMP

The production of a Construction Resource Management Plan (alternatively known as a ‘Site Waste management Plan”) is regarded as best practise by numerous Local Planning Authorities in England. Information on the CD&E phases available at this stage of the planning application is indicative and as such this CRMP is outline. However, it is envisioned that this CRMP will be updated by the principal contractor, or form the basis of a detailed CRMP, as further information relating to the CD&E activities (i.e. material quantities, methods, logistics etc.) of the Site becomes available and is confirmed.

6.2 Construction, Demolition and Excavation Waste

6.2.1 Methodology

6.2.1.1 Construction Waste

Initial estimates of the quantities of construction waste likely to be generated during the construction phase have been calculated based on the total Gross External Area (GEA) of the land use class within the Proposed Development. The quantities of construction waste have been estimated based on BRE (Building Research Establishment) Smart waste (Ref 25) and WRAP (Waste and Resources Action Programme) data (Ref 26). The quantities of materials required during the construction phase will be refined and confirmed at the detailed design stage post-planning.

It is difficult to calculate the precise waste quantities arising from construction. In a best-case scenario, all construction materials would be utilised; however, it is acknowledged that due to over ordering of materials, damage during storage and off-cuts, this is not often the case. The estimated waste arising from the construction of the Proposed Development is dependent upon a number of factors, including construction methodologies, and the nature of the materials used.

Based on the land use (i.e. education) of the Proposed Development and BRE benchmark data, the average construction waste generation rates are as shown in Table 6-1.

Table 6-1: Average Waste (In Tonnes) per 100 m2 of GEA

Land Use Type	Average Waste in Tonnes per 100 m2
Healthcare	19.1

6.2.1.2 Demolition Waste

Demolition waste arisings will be estimated as part of the pre-demolition audit.

6.2.1.3 Surplus Excavated Materials

The estimated quantity of surplus excavated material will be provided by the Civil Engineers.

6.2.2 Anticipated Construction, Demolition Waste and Surplus Excavated Materials Quantities

6.2.2.1 Construction Waste

Quantities of waste arising during the construction phase have been estimated and are detailed within Table 6-2. Other waste types such as doors, frames, partitioning, fixtures and fittings etc. may also be generated, but quantities are not available at this stage.

The total quantity of waste anticipated to be generated from construction of the Proposed Development is approximately 21,095 tonnes (based on a GIA of 102,637 m^2 for the proposed hospital and proposed multistorey carpark). The precise composition and volume of this waste is likely to be dependent on a number of factors and will be further informed by the Principal Contractor, based on their experience on similar developments. At this stage, the estimates are indicative and based on generic benchmark values.

Table 6-2: Estimated Construction Waste Generation

Waste Type	Composition of Construction Waste Stream (%)	Estimated Waste Generation (tonnes)
Bricks	11%	2,271
Tiles and ceramics	0%	84
Concrete	16%	3,295
Inert	14%	2,912
Insulation	1%	309
Metals	4%	832
Packaging	5%	1,019
Gypsum	6%	1,329
Binders	1%	160
Plastics	1%	246
Timber	7%	1,579
Floor coverings (soft)	0%	68
Electrical and electronic equipment	0%	78
Furniture	0%	22
Canteen/office/adhoc	1%	208
Liquids	0%	1
Oils	0%	-
Asphalt and tar	4%	862
Hazardous	0%	87
Other	0%	-
Mixed	27%	5,732
TOTAL	**100%**	**21,095**

6.2.2.2 Demolition

A desk-based pre-demolition audit has been carried out and the estimated quantities of demolition waste are shown in Table 6-3 below.

Table 6-3: Estimated Demolition Waste

Waste Stream	Estimated Quantity (tonnes)
Other insulation materials	25
Other construction materials containing asbestos	22
Concrete	19,653
Bricks	1,711
Wood - untreated	1,180
Glass - uncontaminated	113
Treated wood, glass, plastic (alone or in mixtures) containing hazardous substances	50
Textiles	64
Other bituminous mixtures	28
Aluminium	5
Iron and steel	167
Other soil and stones	3,248
Other gypsum materials	120
TOTAL	**26,386**

6.2.2.3 Excavation waste

Waste materials are expected to be produced by site clearance and excavation activities for earthworks.

The preliminary earthworks assessment carried out by the civil engineering team estimates that the excavation activities will result in a net surplus of approximately 29,800 m^3 of material requiring removal from the Site. Assuming a bulk density of 2 tonnes/m3, this is equivalent to approximately 60,000 tonnes of surplus excavated material.

6.3 Site Waste Management Plan

The Site Waste Management element of this Plan details the likely waste management measures and procedures to be implemented on Site during the CD&E phases. Detailed information will be provided at subsequent stages by the Principal Contractor, once details and methods associated with the CD&E phases are known.

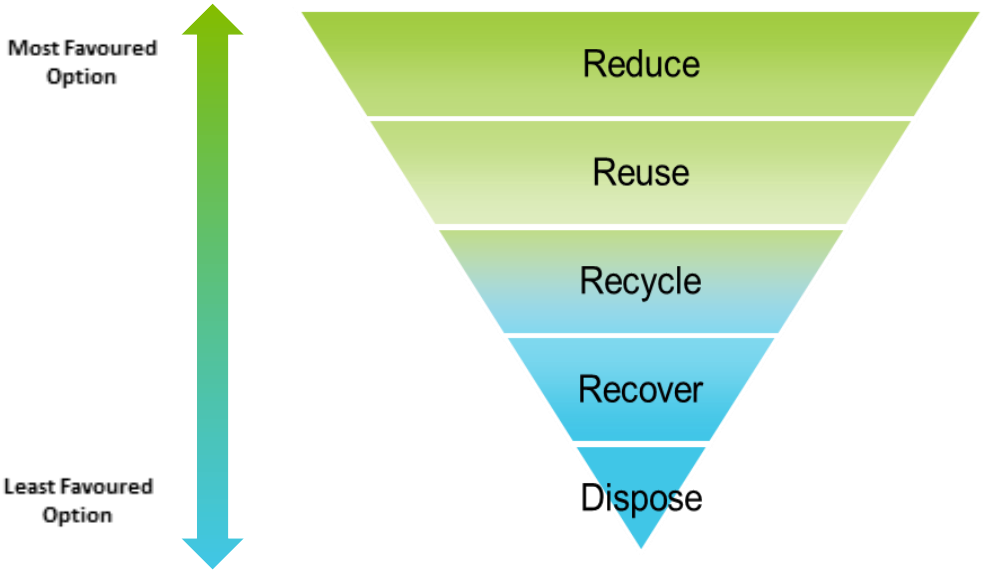
All waste management measures to be implemented on Site will be in accordance with the Waste Hierarchy, as discussed below.

6.3.1 Waste Hierarchy

Those generating waste have a legal duty of care to comply with the Waste Hierarchy. The Waste Hierarchy is a concept that encourages the management and reduction of waste material. The aim is to recover the maximum value from projects/developments by reducing financial losses through material loss during the CD&E phases. The Waste Hierarchy is illustrated in Figure 6-1 and the hierarchy will be considered as a guide to encourage the prevention of waste, followed by reuse, and then recycling.

When determining the most suitable option for waste disposal, the mode of waste transportation and alternatives to reduce adverse environmental effects, transport times and waste capacity must be considered.

Figure 6-1: Waste Hierarchy



All waste management options during the CD&E phases for the Proposed Development will consider the Site's location, natural environment, and available infrastructure. The options presented below will promote waste reduction in line with the Waste Hierarchy.

6.3.1.1 Prevent

The aim is to implement management solutions (such as smart procurement etc) that will prevent the materials turning to waste in the first instance. For example, consolidated material delivery from the same supplier would lead to less packaging waste.

6.3.1.2 Reduce

The aim is to select materials during the design phase that have the potential to be reused at the end of the project life cycle (i.e. design to longevity)

6.3.1.3 Reuse

The aim is to use site-won materials in their current state and form. This can occur either on-site or off-site. For example, any excavated soil that is found to be uncontaminated and meets the required standards can be reused for re-filling purposes.

6.3.1.4 Recycle

construction purpose (for example by crushing concrete or other inert wastes for road construction material). By recycling material on-site as far as practicable, carbon emissions and other adverse environmental effects, are reduced when compared with taking materials off-site.

6.3.1.5 Recover

The aim is to recover value from waste materials which cannot be otherwise reused or recycled. This can include recovery of energy from a suitable Energy-from-Waste (EfW) facility, or otherwise using waste to replace other non-waste materials to achieve a beneficial outcome in an environmentally sound manner, such as application or deposition to land.

6.3.1.6 Disposal

The least preferred option is where the waste stream would be subject to a final disposal route, such as landfill.

The placing of waste disposal contracts will, where possible, consider the implications of long-distance travel in terms of health and safety risk, commercial terms, and increased emissions from vehicles. Wherever possible and practical, contracts are to be awarded to contractors that can manage waste locally (i.e. near to the Site).

All hazardous and non-hazardous wastes must be pre-treated prior to disposal to landfill. The methods of pre-treatment will enable the waste to meet the 'three-point test':

- It must be a physical, thermal, chemical or biological process including sorting;
- It must change the characteristics of the waste; and
- It must do so in order to:

- Reduce its volume, or
- Reduce its hazardous nature, or
- Facilitate its handling, or
- Enhance its recovery.

Source segregation is a pre-treatment option and as such can be applied to waste generation on-site.

A declaration stating the pre-treatment method that applies to the waste will be a part of the Waste Transfer Note (WTN) for non-hazardous waste being disposed of to landfill.

6.3.2 Site Waste Management Measures

Where it is necessary to transport waste to and from the Site, this will be done in compliance with the Waste (England and Wales) Regulations 2011 (as amended) including: transporting waste via registered carriers, disposal to appropriately licensed sites and maintenance of appropriate waste transfer documentation. All relevant contractors will be required to investigate opportunities to minimise and reduce waste generation through the measures provided in Table 6.4.

The disposal of all waste or other materials removed from the Site will be undertaken in accordance with applicable legal requirements. Any waste effluent (including to be discharged into the local sewerage) will be tested and where necessary treated and disposed of at an appropriately licensed facility by a licensed specialist contractor.

The risk of infestation by pests or vermin on Site will be minimised by making adequate arrangements for the disposal of food and other material that may attract pests. Where there is a local infestation, LBH's environmental health officer (EHO) will be consulted about the action to be taken.

The Principal Contractor or an appropriate person (i.e. appointed by the Principal Contractor) will be responsible for on-Site waste management practices and will be agreed with LBH in advance of works. A list of management measured which should be employed on the Site are detailed within Table 6.5.

Should these methods be employed by the Principal Contractor prior to the commencement of the CD&E phases, it is likely that at least 70% of non-demolition waste by volume (i.e. construction waste and surplus excavated material) will be diverted from landfill, in line with the targets set in the Building Research Establishment (BRE) Environmental Assessment Method (BREEAM) Wst 01 – Construction Waste.

Table 6-4: Recommended On-Site Waste Management Measures to Adhere to the Waste Hierarchy

Site Waste Management Measure	Waste Hierarchy Principle	Phase	Waste Stream	Description
Supplier Take-Back	Reduce/Prevention	Construction	Construction Materials	Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme. The Principal Contractor could set up a take-back arrangement with suppliers in order to prevent packets and packaging being broken up and placed in skips.
Just in Time Deliveries	Reduce/Prevention	Construction	Construction Materials	The Principal Contractor should implement a just-in-time delivery system in order to try and avoid the over-ordering of materials and stockpiling. This will prevent surplus materials from risk of damage and disposal as waste.
Standardisation	Reduce/Prevention	Construction	Construction Materials	Use of standard size components in design to eliminate waste at source where possible to do so. The Principal Contractor should implement standard sizes for most items ordered in order to avoid cutting on-site; materials are to be ordered in size in order to allow for minimum waste production.
Pre-assembly and Pre-fabrication	Reduce/Prevention	Design & Construction	Construction Materials	Throughout the design and construction phases of the Proposed Development, emphasis should be on pre-assembly and pre-fabrication of elements wherever practicable to minimise on-Site waste generation and packaging waste.
Re-use of materials on Site wherever feasible	Reuse	Demolition & Construction	Multiple	For example, the Government has set broad targets for the use of recycled and secondary aggregates, and in keeping with best practise, contractors will be required to maximise the proportion of materials recycled.
Concrete Crushing	Reuse	Demolition & Construction	Concrete & Brick	In keeping with guidelines set out by the Government for reclaiming aggregates, deconstructed concrete (if appropriate) will be taken off-site for crushing and re-use. Where practicable, all concrete and brick elements will pass through crushing machines and the residual material will be recycled for use on-site in line with best practice.
Wheel Washers & Rainwater Harvesting Systems	Reuse	All	Liquids	The use of recycling water systems such as wheel washers and rainwater harvesting systems for use in equipment and vehicle washing will be investigated in order to maximise reuse and to reduce energy consumption.
Re-use and recycling of materials off-site	Reuse	All	All	Where re-use on-site is not practical (for example through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).
Segregation of waste at source	Recycling	All	All	Waste segregation strategies will be developed and implemented in-line with the overall logistics plan for the Site. Substances hazardous to health, for example gypsum/plasterboard and liquid waste will be segregated.
Colour coding and Signage	Recycling	All	All	Skips to be colour coded and signposted to reduce risk of cross contamination and covered to prevent dust and debris blowing around the Site, these will be cleared on a regular basis.
Staff training	All	All	N/A	All staff on-site will be appropriately trained on how to reuse materials, prevent and recycle waste.

Table 6-5: Summary of Recommended Best Practice On-Site Waste Management Measures

Waste Management Measure	Waste Stream	Description
Appropriate Concrete Storage used to Minimise Dust and Reduce Vehicle Movement	Concrete	Any processed concrete material should be stockpiled, and any dust generated shall be controlled with covers or dampened with water.
Surface Drainage, Ground Waste Seepage and Dewatering of the Site	Liquid Waste	All surface drainage and dewatering of the Site should pass through a settlement tank prior to entering the foul water sewer. Discharge arrangements into the foul water sewer will be agreed with Thames Water Utilities Limited (TWUL).
Liquid Disposal	Liquid Waste	The Principal Contractor will check that any water, which may have come into contact with contaminated materials will be disposed of in accordance with the Water Resources Act 1991, and to the satisfaction of the Environment Agency or TWUL.
Sealing of Containers	All Hazardous Materials	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.
Classification and Management of Potentially Contaminated Materials	All Hazardous Materials	Should any potentially contaminated materials be identified during the construction phases, work in the area will temporarily cease. The affected area will then undergo a subsequent assessment and an appropriate strategy for treatment and management of the material will be agreed with LBTH. Site-specific chemical tests will be conducted to ascertain the composition of the potential contamination and evaluate the material against the Waste Classification Technical Guidance (WM3) (**Error! Reference source not found.**). In this way, materials can be classified as inert, n on-hazardous or hazardous and disposed of in accordance with relevant legislation or processed for off-Site treatment prior to final disposal. Wherever possible, material will be recycled and re-used (either on-Site or elsewhere).
Audit Trail: Transportation and Disposal	All Waste Streams	The Principal Contractor will dispose of all waste or other materials removed from the Site in accordance with regulatory requirements and provide evidence that all waste has been deposited or transferred to the correct place and by appropriately licensed contractors (i.e. an audit trail). WTNs will be used to document waste production within the confines of the Site and movement to external facilities. These notes will detail the type of waste, waste volume, waste classification, contractor, ultimate disposal route and other necessary information. Records will be updated documenting 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.
Storage	All Waste Streams	The storage of potentially polluting plant and materials will be limited as far as possible. For example, the plant could be re-fuelled from visiting fuel trucks rather than from on-Site fuel bowsers. All spoil will also be stored on impermeable surface areas, with bunding, to the satisfaction of the Environment Agency in order to prevent potential contaminated material coming into contact with flora or fauna. The bunded areas will also prevent contaminants to seep with water, which could allow contaminants to seep into the local drainage network, or leach to groundwater, and have damaging effects on both humans and wildlife.
Damping Down of Surfaces	All Waste Streams	Damping down of surfaces during spells of dry weather and brushing/water spraying of heavily used hard surfaces/access points across the Site as required.
Prohibition of On-Site Waste Burning	All Waste Streams	Burning of waste or unwanted materials will not be permitted on-Site.

6.3.3 Waste Duty of Care

The Waste Duty of Care: Code of Practice sets out practical guidance on how to meet the waste duty of care requirements. This Code applies to anyone who imports, produces, carries, keeps, treats, disposes of or, as a dealer or broker have control of certain types of waste.

All waste generated from site will be managed in line with the Waste Duty of Care requirements. Checks will be in place to confirm that waste is being appropriately managed, and to demonstrate that all reasonable measures have been taken to comply with waste hierarchy. This will include (but not limited to):

- Checking the licence for all waste carriers - to confirm the waste streams they are allowed to carry,
- Checking the waste carrier vehicles, and
- Checking the licence or permit for waste management facilities – to confirm the waste streams these facilities are allowed to accept.

In addition to the above, the Principal Contractor can carry out spot checks to ensure that all requirements are met.

6.3.4 Waste Carriers

All waste generated from the Proposed Development shall be dealt with in accordance with legal requirements. The proposed waste carrier for each waste stream will be recorded in the registration table, with the Waste Carriers' license details appended to the detailed CRMP. An example table for demonstrating waste carrier registration is available in [Appendix A] of this Plan.

The Principal Contractor will ensure that the following information is collected for all waste contractors:

- Contractor's name,
- Waste Carrier License (WCL) number,
- Date(s) of waste removal,
- Type(s) of waste removed (i.e. non-hazardous waste, hazardous waste, inert (specify),
- Method of treatment, recovery or disposal (i.e. reuse, recycling, incineration, landfill etc.),
- Volume or weight of waste removed, and
- Costs associated with waste removal, transport and treatment, including landfill tax charges where applicable.

6.3.5 Waste Documentation

All waste documentation will be retained at the main Site compound and at the Principal Contractor's Head Office following completion of the project. This includes the following:

- Detailed CRMP (two years after end of project),
- Waste transfer documentation (two years of WTNs and three years for hazardous waste consignment notes). No wastes will be transferred from Site unless accompanied by a completed, signed waste transfer note for inert / non-hazardous waste or consignment note for hazardous wastes. Approved transfer documentation will be used to accompany all wastes,
- Copies of any exemptions or permits, and
- Copies of waste carrier and disposal site licenses.

6.3.6 Waste Transfer Note (Non-Hazardous Waste)

All movements of waste from Site must be accompanied by a WTN, which will detail specific information. The Principal contractor or the Principal Contractor's appointed person will check that each WTN contains the following:

- The name of the person receiving the waste and what they are authorised to do with that waste as a Registered Waste Carrier can only transport waste,

- Type of waste produced,
- The 2007 Standard Industrial Classification (SIC) code (2003 SIC code if it is hazardous waste),
- The six-digit European Waste Catalogue (EWC) number,
- Address of the producing site and details of the waste producer,
- Waste carrier's details including Waste Carrier Licence (WCL) number,
- Quantity of waste,
- How it is contained (for example 8-yard skip),
- Address of the receiving site (for example landfill) and the Environmental Permit or Exemption Number associated with the receiving site,
- The date to which the WTN applies,
- If the material is non-hazardous waste and it is destined for disposal directly to landfill, pre-treatment must have been applied and a declaration detailing treatment applied appended to the WTN, and
- A declaration that the waste has been treated in line with the requirements of the waste hierarchy.

Only the Principal Contractor or the Principal Contractor's appointed person will be authorised to sign the WTN. These WTN's will be maintained within the project file for a minimum period of three years.

By signing a WTN, the Principal Contractor or the Principal Contractor's appointed person is confirming that all details are correct and that the material is to be sent by a licensed waste carrier to a suitably licenced receiving site, permitted to receive that type of waste. The signature is binding of this fact and completes the WTN as a legal document, which must be retained for a minimum of two years (three years if it is hazardous).

The Principal Contractor or the Principal Contractor's appointed person signing the WTN shall additionally ensure that the Waste Carrier is using a suitable vehicle with adequate, covered containment for the waste.

6.3.7 Waste Consignment Note (Hazardous Waste)

A Hazardous Waste Consignment Note shall be completed for every movement of hazardous waste and should be retained for a three-year period. Prior to signing, Principal Contractor or the Principal Contractor's appointed person shall ensure that the Hazardous Waste Consignment Note includes:

- Hazardous Waste Premises Code (for sites in England and Wales only),
- Consignment note code,
- SIC Code,
- Name and address of site from which waste is being moved,
- Date of removal,
- Type of waste produced, including the quantity and the EWC code,
- The name of the person who is receiving the waste and what they are authorised to do with that waste, for example a Registered Waste Carrier can only transport waste, and
- A final disposal site that is authorised to accept the waste.

6.3.8 Fly-Tipping

Fly-tipping of waste on or adjacent to ongoing construction projects can be a significant issue.

Appropriate security controls will be in place regarding the management of waste generated from the Site. Should waste be fly tipped on the Site, the Principal Contractor has a Duty of Care to ensure that it is dealt with safely and disposed of correctly, even though they are not the producer of the waste. Any instance of fly-tipping will be reported to LBH.

6.4 Reporting, Monitoring and Auditing

This Plan is outline and once details of the construction activities including but not limited to material quantities are available , it is envisioned that the Principal Contractor will update this outline CRMP or prepare a detailed

CRMP. The detailed CRMP will include roles and responsibilities, details of control measures, activities to be undertaken to minimise environmental impact, and monitoring and record-keeping requirements. A commitment will also be included to periodically review the detailed CRMP and undertake regular environmental audits of its implementation during the construction phases of the Proposed Development.

The effectiveness of the detailed CRMP will depend upon the enforcement of its requirements on-Site by the Principal Contractor or the Principal Contractor's appointed person . Responsibility for the formal recording of waste movements lies with the Principal Contractor or the Principal Contractor's appointed person .

It is the responsibility of the Principal Contractor or the Principal Contractor's appointed person to maintain a log for all the materials that come on to Site, and details obtained from the waste disposal company of the exact amount of waste materials removed from Site. Details would also be provided outlining the recovery/disposal actions for the specific waste streams.

Waste receptacles should be monitored by the Principal Contractor or the Principal Contractor's appointed person so that contamination does not occur; the monitoring results should then be recorded and monitored for change with time.

The Principal Contractor or the Principal Contractor's appointed person should continually review the type of surplus materials being produced and, where possible, change the activities on Site to maximise reuse or recycling. Disposal to landfill should be seen as the last option.

'Spot checks' may be made in relation to the completeness of any WTNs and any Hazardous Waste Consignment notes by the Applicant or their representatives.

If any problems are identified during the lifetime of the project in relation to exceeding the expected waste stream volumes in the detailed CRMP prepared by the Principal Contractor (e.g. failure to meet stated targets or issues relating to cost effective and legal transfer of waste materials), then they should be escalated to the Contracts Manager for further discussion on the best solution.

The Applicant's representative will undertake regular inspections and risk-based inspections (RBI) to provide continuous feedback on the environmental performance of the site and highlight areas for commendation as well as areas for improvement.

6.4.1 Review of the Detailed CRMP – Monitoring Record

The detailed CRMP should be reviewed at least once every six months during the lifetime of this project by the Principal Contractor to ensure that waste targets are being achieved and that realistic solutions are provided for unplanned events or abnormal wastes arising. The CRMP will also be reviewed if there is any significant change in the project. These reviews will involve the completion and submission of a monitoring report to the Applicant (or their representative) in an agreed format.

An example of a method of recording any change or alterations to the detailed CRMP is provided in Appendix B of this Plan.

6.4.2 Site Inspection

The Principal Contractor or the Principal Contractor's appointed person should undertake a daily inspection of the construction areas including all areas used for waste management and storage. Any issues would then be recorded in the daily log along with any corrective action taken.

6.4.3 Closure Reporting

Within 3 months of the completion of works under a contract, a Waste Management Closure Report should be submitted to the Applicant (or their representative) to demonstrate the effective implementation, management and monitoring of construction waste and surplus excavated material during the construction life time of the Proposed Development. This report should at least include:

- The types and quantities of waste generated during different phases of construction,
- Quantities or percentage of waste being recycled or re-used,
- Quantities of waste being sent off-site for treatment or disposal,
- Information on the end destination,

- Management routes, and
- Notes on non-compliances and enforcement actions taken

Appendix A - Waste Carrier Record (Template)

Waste type(s)	Waste Carrier Name	Contact Details	Date checked with EA (dd/mm/yyyy)	Registration Number	Expiry Date (dd/mm/yyyy)

Appendix B – Waste Management Tracker (Template)

Site Waste Management Tracker			
Project Name		**Project Phase**	
Project Location		**Responsible Person**	
Client		**Name of Person Filling in**	
Principal Contractor		**Description of the Phase**	
		Reason for deviation from the Plan	

Summary of Waste Removal

	Waste Description	Planned Quantity (m^3) to be removed	Actual Quantity (m^3) removed	Reasons for Deviation
Inert				
Non-Hazardous				
Hazardous				

Daily Waste Removal

	Date of removal	Waste Description	Qty. reused on Site (m^3)	Qty. reused off site (m^3)	Qty. Recycled on-site (m^3)	Qty. recycled off site (m^3)	Qty. sent to Landfill/other special or exempt site (m^3)	Destination of Waste Materials	Carrier Details, Registration number, licence details
Inert									
Non-Hazardous									
Hazardous									

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