Clifton Scannell Emerson Associates

Preliminary Construction Waste Management & Recycling Strategy

Data Centre at Unit 4, Silverdale Road, Silverdale Industrial Estate

Client: Marvell Developments LLC

Date: 08 October 2024

Job Number: 24_079

CONSULTING ENGINEERS

Civil Engineering | Structural Engineering | Transport Engineering | Environmental Engineering | Project Management | Health and Safety

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Document Control Sheet

Project Name:	Data Centre at Unit 4, Silverdale Road, Silverdale Industrial Estate
Project Number:	24_079
Report Title:	Preliminary Construction Waste Management & Recycling Strategy
Filename:	RPT-24_079-CSE-00-XX-RP-0002

Issue No.	Issue Status	Date	Prepared by	Checked by
P01	DRAFT PLANNING	12/09/2024	JT	CD
P02	PLANNING	08/10/2024	JT	CD

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1 Introduction

This Preliminary Construction Waste Management and Recycling Strategy has been prepared by Clifton Scannell Emerson Associates (CSEA) in support of the planning application to the London Borough of Hillingdon for the proposed datacentre The site is located within the Silverdale Industrial Estate, Unit 4 Silverdale Rd, Hayes, UB3 3BL and is approximately 19.70km West of London city centre.

This document should be read in conjunction with the Preliminary Construction Management Plan (CMP) as it addresses the potential impacts of waste generated during the site preparation and construction phases. The primary goal is to develop a strategy that ensures legislative compliance and promotes best practices in the separation, storage, collection, treatment, and/or disposal of waste materials.

The report also outlines the opportunities for implementing waste mitigation measures for the potential impacts arising during each phase of the development to ensure that such measures are consistent with both Government and local authority waste policies and targets.

1.1 Structure of the Report

This report is set out in the following format:

- Section 2: Details of the site location, the proposed layout, and the existing conditions of the site. It also provides an overview of the scope of works for the proposed development.
- Section 3: An overview of the national and waste legislation consulted with relevance to the proposed document.
- Section 4: Summary of the scope of works required for the development.
- Section 5: Comprehensive construction waste management strategy providing best practices which are to be considered throughout each phase of the proposed development.
- Section 6: Summary

2 Site Location & Existing Land Use

2.1 Site Location

The site is located within the Silverdale Industrial Estate, Unit 4 Silverdale Rd, Hayes, UB3 3BL and is approximately 19.70km West of London city centre. The proposed development is positioned 550m from Hayes and Harlington Train station and is 1.29 km from J3 Cranford Parkway Interchange of the M4. Figure 1 and Figure 2 are provided to illustrate the site location as well as the extents of the planned development.

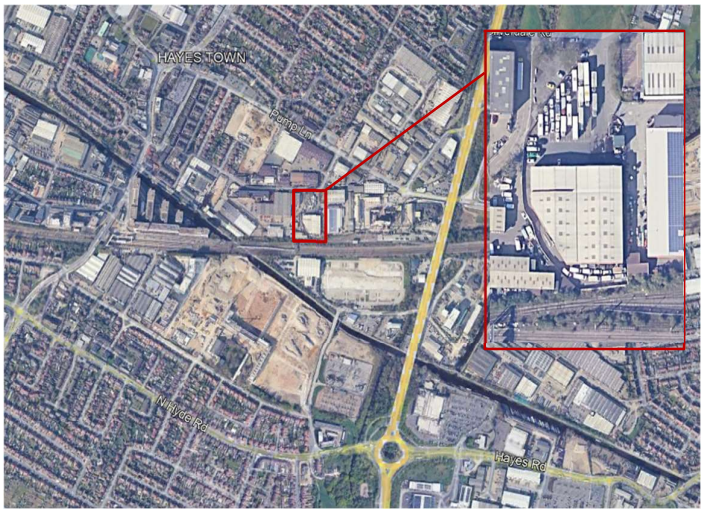

Figure 1: Proposed Development Site Location

Figure 2: Extent of Site Development

The site is bound to the north and south by Silverdale Road, and Hayes and Harlington Railway respectively. The site is currently accessed via a single gate on a two-lane road off Silverdale Road which can be accessed from Pump Lane. Access to Pump Lane is from the A312 to the East or from Botwell Lane to the west.

2.2 Existing Site Condition

2.2.1 Existing Building

Historically, the proposed site was used for a vehicle repair service, storage and a distribution yard (Class B8 however vacant since January 2022). The layout of the site is comprised of three main areas as illustrated by Figure 3. A hardstanding of approximately 1,647 sq.m is situated in the northern portion of the site, adjacent to the site entrance.

The site boundary is secured by palisade fencing along the north, east and western boundaries and a concrete block wall along the southern boundary. A secure gate in the north provides access to site from Silverdale Road.

Figure 3: Existing Site Buildings

2.2.2 Topography

A topographical survey of the site was undertaken in August 2024 by Plowman Craven. The ground levels at the site are mostly flat, with a large service yard area located north of the existing warehouse building. The external finishes at the site is mostly asphalt, with some areas of concrete hardstanding areas such as to the front of the four roller shutter doors and entrance area.

The service yard to the north of the building gently slopes to a central drainage channel that traverses the yard from west to east (from 30.9mAOD at the building to 30.6mAOD at the channel).

There is a significant level change along the western boundary of the site, with the site retained approximately 700mm higher than the neighbouring property, with level variations of 30.92mAOD on-site to 30.24mAOD in the neighbouring property.

2.2.3 Geotechnical Conditions

A comprehensive ground investigation was carried out by Concept Engineering Consultants Ltd in April 2023. Table 2-1 below shows a summary of the geological conditions found at the development.

Table 2-1: Summary of Ground Materials on the Proposed Development Site

Stratum	Approx Top of Stratum	Approx Thickness	Description
Made Ground	31mAOD	Up to 5m	Asphalt over dark grey and brownish slightly sandy slightly clayey GRAVEL with high concrete cobble content. Brown and dark grey slightly sandy slightly gravelly clayey SILT. Brick, concrete and asphalt fragments. Firm, brown slightly sandy slightly gravelly silty CLAY.
Alluvium	29mAOD	2m	Firm, dark grey mottled grey slightly sandy slightly gravelly silty CLAY with rare pockets of organic matter and dark brown silt.
Langley Silt	29.5mAOD	0.5m	Present in one trial pit. Orangish brown mottled grey and brownish grey slightly sandy gravelly CLAY.
Lynch Hill River Terrace Deposits	28mAOD	1m	Medium to very dense, orangish brown fine to coarse SAND and angular to rounded fine to coarse flint GRAVEL
Weathered London Clay	27mAOD	2m	Firm to stiff, brown mottled bluish grey slightly micaceous CLAY with occasional pockets of orangish brown silty fine sand, calcrete silt nodules, roots and rootlets
London Clay	25mAOD	-	Firm, brownish grey and grey silty CLAY with occasional pockets of greenish grey silty sand, white flecks and bioturbation.

2.2.4 Environmental Conditions

The ground investigation undertaken at the site recorded low levels of contamination, primarily asbestos, within the Made Ground. No significant contamination was encountered, and the contamination recorded will not have a material impact on the proposed development or necessitate remedial works.

Asbestos is present in the Made Ground and risks from the exposure to asbestos will need to be mitigated during construction and recorded in the site safety records to inform any future groundworks. Risks to the future site users would be mitigated through provision of cover layer at the site, comprising the building footprint and external hardstanding.

3 Description of Proposed Development

The project scope includes the demolition of the existing building and structures on site, and all other associated site clearance works. Construction of a data centre building (Class B8) with plant at roof level with an emergency generator (1no.) and associated flue (provided within an external compound adjoining the data centre building), sprinkler tank and pumphouse, security guard house, and provision of one kiosk substation and MV Building. The development also comprises the construction of a new access and internal road and circulation areas, footpaths, provision of car and bicycle parking, hard and soft landscaping and other associated works and ancillary site infrastructure.

The siteworks include, but are not limited to,:-

- Underground utilities/ services;
- Installations related to services/ utilities;
- New internal boundary structures, security fences and gates;
- Roads and carriageways including car parking and truck loading/ unloading;
- Sundry ancillary and related works

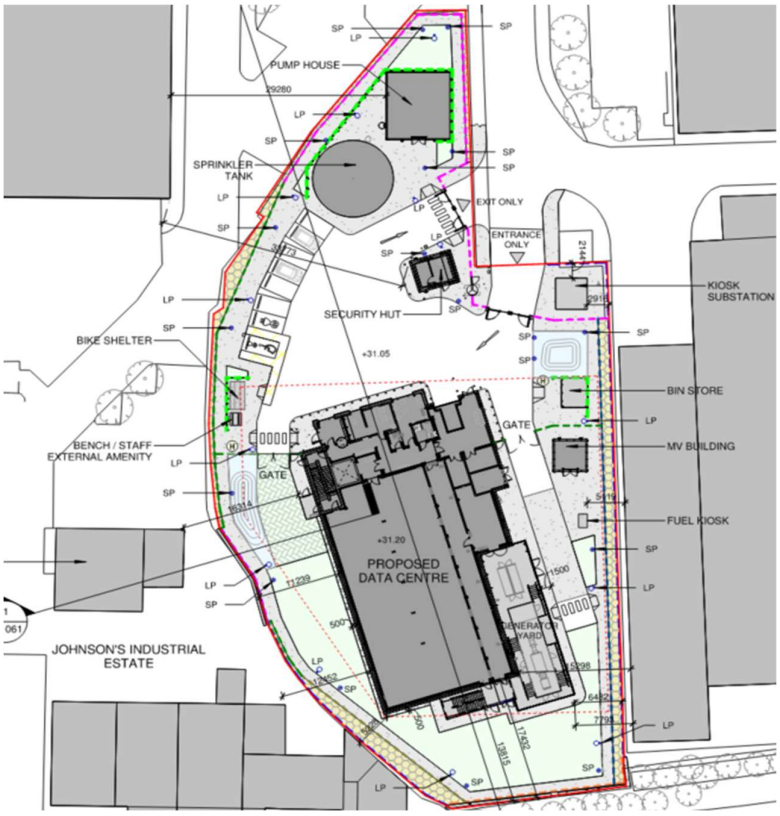

Figure 4: Proposed Development Overview

4 Waste Legislation, Policy and Guidance

4.1 Introduction

This section outlines the national legislation relevant to the proposed development. It also lists the national, regional, and local waste policies and guidelines reviewed in the preparation of this Waste Management and Recycling Strategy.

4.1 National, London and Local Waste Policy

The waste management strategies on UK construction sites are guided by key principles embedded in national and local policies. Central to all waste policies, actions based on environmental impact, from prevention to disposal are prioritised.

Furthermore, UK policies increasingly promote the adoption of circular economy principles, emphasizing resource efficiency, re-use, and waste minimization. By integrating these principles, construction sites can effectively manage waste, reduce environmental impact, and ensure compliance with regulatory requirements.

Several national and local waste management policies should be reviewed alongside this waste management strategy document, including but not limited to:

- The Waste Framework Directive (2008/98/EC)
- The Construction (Design and Management) Regulations (2015)
- The Clean Neighbourhoods and Environment Act (2005)
- The Waste (England and Wales) Regulations (2011)
- National Planning Policy Framework (2021)
- National Planning Policy for Waste (2014)
- Waste Management Plan for England (2021)
- The London Borough of Hillingdon *Local Plan Part 2 – Development Management Policies* (2020)

5 Construction Waste Management Strategy and Best Practice

5.1 Introduction

The following report sections outline the waste management and recycling best practices that will be implemented during the construction phase of the proposed development, as described in Section 3.

5.2 Site Establishment

Subject to a successful grant of planning, it is intended for the works to commence in Q1/Q2 2025. The proposed development is anticipated to be constructed over a 12-month period, with the assumption that peak construction for the proposed development will occur in Q2/Q3 2025.

The Principal Contractor, once appointed, shall provide all necessary accommodation, material handling and secure storage for its operations.

The facilities to be provided and maintained by the Principal Contractor shall include:

- Construction plant;
- Hoisting equipment and cranes;
- Scaffolding, platforms, access ladders, barriers, handrails;
- Barricades and hoardings;
- Temporary driveway, road crossovers, and construction zone;
- 24/7 emergency vehicle access to site during working hours;
- On-site hardstand areas for vehicle loading and unloading;
- Storage sheds and compounds;
- Rubbish sorting areas;
- Site amenities with all required equipment and facilities;
- Construction worker accommodation, if required;
- First aid facilities;

First Aid facilities for the use of all construction staff in the form of a fully provisioned first aid area within the site office with life-saving and safety equipment as required by relevant statues, authorities and awards shall be maintained at all times by the contractor.

The Principal Contractor is responsible for obtaining all required permits, pay the applicable fees and comply with all conditions.

5.3 Site Waste Management Plans (SWMP)

A Site Waste Management Plan (SWMP) should be prepared by the appointed principal contractor. The document includes a detailed identification of the types of waste that will be generated on site and an estimation of the anticipated volumes thereof. The SWMP provide strategies for reducing, reusing, recycling, and properly disposing of these materials. It outlines specific procedures for segregating waste, maintaining proper documentation, and ensuring compliance with relevant regulations

Additionally, the SWMP designates roles and responsibilities for waste management, ensuring regular monitoring, reporting, and continuous improvement throughout the construction project.

5.4 Demolition Waste Generated by the Proposed Development

Waste materials will be generated from the demolition of existing buildings and hardstanding areas on-site, as well as from the excavation of building basements and foundations, general site clearance, and the construction of buried services.

It is required that a detailed pre-demolition audit be undertaken by the contractor before any demolition activities take place, to quantify the types of demolition waste materials. The volume of waste from demolition will be more challenging to segregate than that from the construction phase due to the integration of building materials, such as steel rebar embedded in concrete and electrical ducting and services.

Additionally, soil, stones, made ground, and rock will be excavated to facilitate site clearance, construction of new building foundations, and installation of services.

5.4.1 General Waste from Demolition Works

While the exact type, nature and quantity of the site demolition waste has not yet been determined, the typical type of demolition waste can be summarised as below:

- Concrete, bricks, tiles, and cement
- Wood
- Glass
- Plastics
- Bituminous mixtures, coal tar, and tarred products
- Metals (including their alloys)
- Soil and stones
- Insulation materials (possibly including asbestos-containing materials)
- Gypsum-based construction material
- Materials containing mercury
- PCB-containing materials (e.g. sealants, resin-based floorings, capacitors, etc.)
- Waste electrical and electronic equipment
- Oil wastes and the waste of liquid fuels
- Batteries and accumulators
- Packaging (paper/cardboard, plastic, wood, metal, glass, textile, etc.)

All ground excavations should be carefully monitored by a suitably qualified person to ensure that potentially contaminated soil is identified and segregated. In the event that any potentially contaminated material is encountered, it will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous.

5.4.2 Asbestos

Asbestos Containing Materials (ACMs) have been discovered at the site as detailed in the *Ground Investigation Factual Report* issued by Concept Engineering in April 2023. Possible asbestos fragments have been identified in the made ground, and risks from asbestos exposure will need to be mitigated during construction. These measures should be documented in the site safety records to inform any future groundworks.

The ACMs should be considered by the Contractor and, where necessary, be removed to the requirements of The Control of Asbestos Regulations 2012.

5.4.3 Hazardous Materials

All hazardous materials will be removed prior to the commencement of demolition works. However, some soft stripping may be necessary to ensure sufficient access for their removal. Hazardous waste materials will be transported by licensed carriers and disposed of at suitable off-site facilities.

5.4.4 Demolition Process

An appointed contractor will conduct a detailed pre-demolition audit to quantify the types of demolition waste materials before demolition activities begin. Materials will be segregated into waste streams, separating hardcore, timber, and metal products. The separated materials will be loaded for off-site recycling or disposal as required.

The demolition contractor will collaborate closely with the developer to ensure full compliance with and achievement of recycling targets. All demolition debris will be crushed on-site and stored in central stockpiles for use in the construction process where practicable.

5.5 Site Preparation and Excavation Waste

Waste generated from site clearance, primary infrastructure, and earthworks is anticipated to include rubble, tarmac from previous hard standings, gravel, clay, and potentially contaminated materials. Clean excavated material that cannot be reused on-site will be removed by licensed waste carriers and either repurposed at another development site or disposed of at appropriately licensed facilities, likely inert waste landfill sites.

6 Pre-Construction Planning

Prior to construction, the Principal Contractor and relevant sub-contractors can consult the Waste Minimisation and Management (WMM) guideline prepared by Waste and Resources Action Programme (WRAP). Figure 5 below shows the steps that should be considered prior to the construction phase.

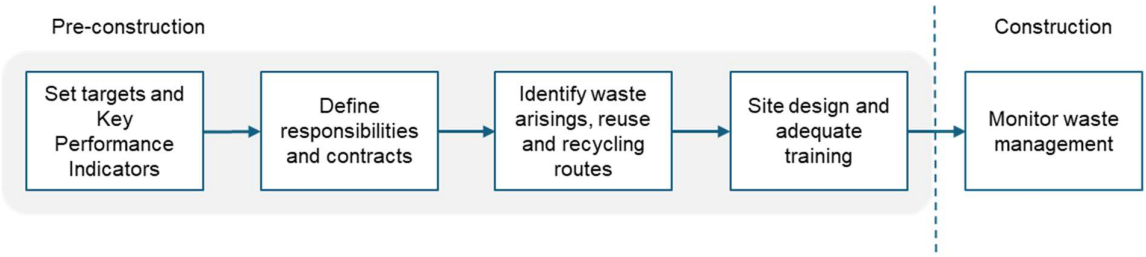

Figure 5: Pre-construction Planning for Waste (Adapted from WRAP,

6.1.1 Setting Targets

Key Performance Indicators (KPIs) enable the broad performance of the project can be compared to industry benchmarks. The WMM document provided by WRAP recommends that the following KPIs be established:

- Recovery of waste materials for reuse and recycling;
- Reuse of materials already on site; and
- Reduction in tonnage of waste per unit of construction activity.

The measurement of "percentage recovery" KPIs enables the broad performance of projects to be compared between projects by clients and contractors. Performance indicators and benchmarks being developed by BRE under the *SMARTWaste* scheme allow projects to be categorised as Standard, Good and Best Practice projects in comparison to industry benchmarks.

Table 6-1 below provides an example of the best practice performance benchmarks that have been established by WRAP for a range of materials. The recovery rates shown in the table are for total recovery, both on and off the site.

Table 6-1: Standard, Good, and Best Practice Recovery Rates

Material	Standard Recovery (%)	Good Practice Recovery (%)	Best Practice Recovery (%)
Timber	57	90	95
Metals	95	100	100
Plasterboard	30	90	95
Packaging	60	85	95
Ceramics	75	85	100
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95

Material	Standard Recovery (%)	Good Practice Recovery (%)	Best Practice Recovery (%)
Miscellaneous	12	50	75
Electrical Equipment	Limited	70**	95
Furniture	0-15	25	50
Insulation	12	50	75
Cement	Limited	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited Information***	Limited Information***
* Proposed waste management actions. 'Reuse' and 'recycling' are forms of waste recovery.			
** This is a required recovery target for the type of Waste Electrical and Electronic Equipment (WEEE) likely to be produced from construction sites, e.g. lighting (the WEEE Regulations)			
*** This cannot be 100% as most hazardous waste streams (e.g. asbestos) must be landfilled.			

6.1.2 Responsibilities and Contracts

The Principal Contractor would be responsible for the setting and review of waste targets from the outset to ensure that high standards are maintained with the emphasis being on continual improvement.

In accordance with best practice in waste management, a designated waste champion or environmental coordinator will be appointed to oversee all waste management activities. This role will encompass coordinating all on-site waste and environmental issues, including managing waste data and identifying training requirements.

6.1.3 Waste Arisings, Reuse and Recycling Routes

The identification of waste arisings and their subsequent management is the core of the SWMP. It is important to establish which work package will generate the waste, an estimation of quantities, the waste owner, the waste management method and any control measures.

6.1.4 Site Design and Training

Waste management best practice recommends that the site design make provision in terms of planning and access to waste management facilities. This may include consideration of the following:

- Layout and locations of waste skips;
- Separation methods and containers for hazardous waste;
- Clear definition and signage of waste protocol and material storage areas;
- Segregation of waste containers and the use of compactors and balers;

Similarly, best practice methods include frequent training of the full workforce and continuous feedback from aspects including:

- Site induction and toolbox talks;
- Specific training for key staff regarding on-site environmental issues;

6.2 Construction Phase Waste

The waste generated during the construction phase of the proposed development may be similar in nature and classification to the waste generated during the demolition phase as discussed in Section 5.4.1. For the entire duration of construction, the Principal Contractor shall ensure appropriate and safe storage, monitoring and disposal of all waste generated on site as per the SWMP prepared.

6.2.1 Raw Material and Waste Storage

The location and provision of raw materials and waste storage on-site would be clearly labelled, identifying the materials that can be received. Provisions that would be made would include:

- Temporary offices retaining all details relating to health and safety and waste management monitoring and reporting details; Storage areas for raw materials and assembly areas for construction components would be located away from sensitive receptors;
- Colour-coded skips/containers would be provided for segregated waste streams for reuse and recycling;
- Dedicated skips would be provided for any waste that requires off-site disposal;
- Hazardous waste materials would be stored in secure bunded compounds in appropriate containers which are clearly labelled to identify their hazardous properties and are accompanied by the appropriate Control of Substances Hazardous to Heath (COSHH) assessment sheets;
- Any fuels, oils and chemicals would be stored in appropriate containers within secure bunded compounds in accordance with good site practice and regulatory guidelines and located away from sensitive receptors.

6.2.2 Monitoring and Reporting Waste

It would be a condition of contract for the Principal Contractors to discuss and agree any recovery rates (see Table 5 3 above) to be targeted at the inaugural meetings. A monitoring report would then be generated on a regular basis which would include details of the progress made in diverting waste materials from landfill, against these pre-agreed targets.

Waste measurement can include cost, type of waste, amount by volume and tonnage, reason for generation and management route. The actual waste quantities obtained should be compared with the initial targets set during the preparation of the SWMP to identify if the site is under-performing and whether corrective action is required to get back on track. *TheSMARTWaste* auditing tool may be used as a means of logging and generating data.

6.2.3 Minimising Waste during Construction

Several waste minimisation strategies have been detailed throughout this document. Table 6-2 summarises the most important mitigation measures to minimise the potential waste of on-site materials during the proposed works. It is important to note, however, that not all raw materials would be provided by local suppliers.

Table 6-2: Mitigation Measures to Minimise Potential Waste

Ordering	**Delivery**
Avoid: • Over-ordering (order 'as needed') • Ordering standard lengths rather than lengths required • Ordering for delivery at the wrong time (update programme regularly)	Avoid: • Damage during unloading • Delivery to inappropriate areas of the site • Accepting incorrect deliveries, specification or quantity
Storage	**Handling**
Avoid: • Damage to materials from incorrect storage • Loss, theft or vandalism through secure storage and on-site security	Avoid: • Damage or spillage through incorrect or repetitive handling

6.3 Traffic and Transport Impacts

The logistics associated with waste from the proposed works would be affected by a wide range of factors. The quantity and types of waste materials generated would fluctuate during this period and the resulting number of waste collections would be dictated by a range of variables, including the amount of storage space for waste, the capacity of containers used, the materials segregated for recycling and whether any on-site processes would be used for reducing the volume of waste (compactors/balers/shredders etc.).

The Principal Contractors would provide construction waste logistics forecasts, which would be discussed with waste contractors and SBDC following the appointment of relevant parties.

The impact of traffic associated with the movement of raw and waste materials during the proposed works on surrounding neighbourhoods and the local road network would be minimised by a combination of factors. Options include minimising, where possible, the off-site removal of waste to landfill and adoption of vehicle backhauling.

7 Summary

This Preliminary Waste Management and Recycling Strategy has been prepared alongside the Preliminary CMP in support of the planning application to the London Borough of Hillingdon for the proposed data centre development. The site is located within the Silverdale Industrial Estate, Unit 4 Silverdale Road, Silverdale , UB3 3BL and is approximately 19.70km West of London city centre.

This report has provided an overview of the existing site conditions and the proposed development, offering context for the waste management strategies outlined. Waste generation is expected at every phase of the development, and this strategy document identifies key opportunities for effective waste minimisation, management, measurement, and monitoring throughout the project. Additionally, it offers guidance on implementing best practice measures to ensure sustainable waste management across all stages of the construction process.

8 References

1. Environmental Protection Agency, *Waste classification: list of waste & determining if waste is hazardous or non-hazardous* (2018).
2. Great Britain. Health and Safety Executive. *Construction (Design and Management) Regulations* (2015).
3. London Borough of Hillingdon, *Local Plan Part 2 – Development Management Policies* (2020).
4. Ministry of Housing, Communities & Local Government, *National Planning Policy Framework* (2021).
5. UK Government, *Environmental Protection Act* (1990).
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7. UK Government, *The Waste (England and Wales) Regulations* (2011).
8. WRAP (Waste and Resources Action Programme), *Achieving Good Practice Waste Minimisation and Management* (2015).

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