Pre-Redevelopment and Pre-Demolition Audit Report

Land at the former Sipson Garden Centre

Lewdown Holdings Ltd

21/12/2023

Document Control

Version	Date	Comments	Author	Checked By	Verified By
V01	08 December 2023	First Draft Report	Nafey Bin Afan Resource and Waste Consultant	Nafey Bin Afan Resource and Waste Consultant	Kat Lees Resource and Waste Consultant
V02	21 December 2023	Final Report	Nafey Bin Afan Resource and Waste Consultant	Nafey Bin Afan Resource and Waste Consultant	Kat Lees Resource and Waste Consultant

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1. Introduction

1.1 KaNect Limited (hereafter referred to as 'KaNect') has been appointed by Lewdown Holdings Ltd (hereafter referred to as the 'Applicant') to prepare a Pre-Redevelopment and Pre-Demolition Audit Report (hereafter referred to as the 'Report') in support of the proposed Land at the former Sipson Garden Centre development (hereafter referred to as the 'Proposed Development'), located within London Borough of Hillingdon (LBH).

1.2 The wider site covers approximately 17 acres (7ha) of land 1km north of Heathrow Airport along the M4, just northeast of Sipson village and is designated as Green Belt. The Site is partially previously developed with the former Sipson Garden Centre occupying just under a hectare. The development Site consists of hardstanding and dilapidate structures associated with the previous use, the wider site within the Applicant's ownership consists of informal grassland.

1.3 Figure 1 shows the site location plan.

Figure 1 Location Plan

This Figure is not drawn to scale.

1.4 As per the BREEAM New Construction 2018 (UK), a total of 5 credits can be obtained for the Wst 01 Construction Waste Management criteria. These credits are split into three parts (for Fully fitted) including:

- One Credit – Pre-Demolition Audit:
  - Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This audit will:
    - Be carried out at Concept Design stage by a competent person prior to strip-out or demolition works.
    - Guide the design, consider materials for reuse and set targets for waste management.
    - Engage all contractors in the process of maximising high-grade reuse and recycling opportunities.
    - Refer to the audit in the resource management plan (RMP)
    - Compare actual waste arisings and waste management routes used with those forecasts and investigate significant deviations from planned targets.
- Up to Three Credits – Construction resource efficiency: preparing a compliant Resource Management Plan (RMP) with the aim of minimising and monitoring waste.
- One Credit – Diversion resources from landfill

1.5 As per the London Plan Guidance: Circular Economy Statement to meet Policy SI7 (B) of the London Plan (2021) one of the requirements is to submit a Pre-Redevelopment audit. The Pre-Redevelopment audit is a tool for understanding whether existing buildings, structures and materials can be retained. The Pre-Redevelopment audit should outline an explanation of the existing buildings on the site and brief description of state of their repair. The details should include: the building's age, key materials, photos of typical internal spaces and facades, and site plans.

1.6 The extent of details required to complete the Pre-Redevelopment audit is not mentioned by the Greater London Authority (GLA), therefore, based on KaNect's previous experience, information included in Section 2, is considered to be useful in understanding the approach adopted for the redevelopment of the Proposed Development.

2. Existing Site

2.1 As mentioned in paragraph 1.2, the existing Site comprises of a shed, dilapidated structures i.e., greenhouse building and hardstanding.

- **Shed** – This building is built from structural timber beams with timber external walls and doors. The roof is covered in cement fibre corrugated panels.
- **Greenhouse Building** – This building is made from structural metal and covered in single glazed panels. There have been some additions/adaptations over time. With the inclusion of hard insulation panels to the roof, Polyvinylchloride (PVC) sunscreen film and half built timber infill walls at the rear gables.

2.2 Image 1 - Image 2 provides some images of the buildings on-Site.

Image 1 Shed

Image 2 Greenhouse Building

3. Proposed Works and Justification to the adopted approach

3.1 Due to the fact that the existing buildings are structurally unsafe and are in a condition that it is not technically feasible or viable to retain or retrofit the buildings, therefore, it is proposed that all existing buildings, structures and hardstanding are demolished.

4. Aims and Objectives

4.1 The main aim of the Report is to understand whether the existing buildings, structures and materials can be retained, refurbished, or incorporated into the Proposed Development. This Report will also help to identify and quantify the materials that might be generated on-Site (if the buildings undergo demolition) and to provide the Applicant with this information to assist the Applicant in maximising the recovery of material for subsequent high grade or value applications.

4.2 The objectives of this Report are to:

- Provide brief information on the existing buildings, structures on site and their condition,
- Identify the types and quantities of key materials present in the existing buildings, structures, and hard services,
- Identify potential applications and any related issues for the reuse and recycling of the key waste/materials in accordance with the waste hierarchy,
- Identify opportunities for reuse and recycling on-Site and off-Site,
- Identify local re-processors or recyclers for recycling of materials,
- Identify overall recycling targets where appropriate,
- Identify reuse targets where appropriate, and
- Identity overall landfill diversion rate for all key materials.

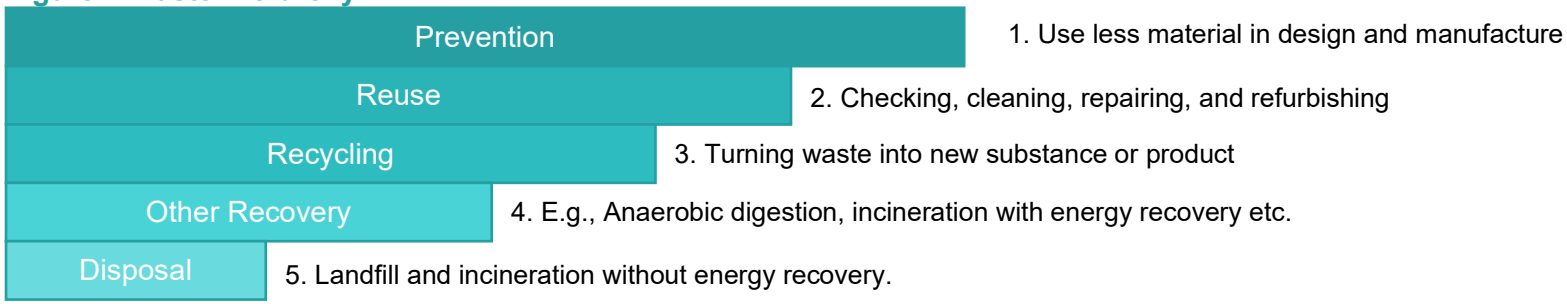
5. Key Principles

The Waste Hierarchy

5.1 Clause 12 of The Waste (England and Wales) Regulations 2011 requires that anyone involved in the import, generation, collection, transferring, recovery, or disposal of waste must take all such measures available to apply the waste hierarchy.

5.2 This Report considers the waste hierarchy and encourages materials identified on-Site to be reused before they are sent for recycling, recovery, or disposal. The main principles of the waste hierarchy are summarised in Figure 2.

Figure 2 Waste Hierarchy[1]



[1] Department of Environment, Food & Rural Affairs (Defra), Waste Hierarchy Guidance (updated by KaNect Limited)

The Circular Economy

5.3 A Circular Economy (CE) is a systematic approach to economic development designed to benefit businesses, society, and the environment. In contrast to the 'take make waste' linear model, a Circular Economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources. The Circular Economy activity focuses on design that is regenerative and restorative. This is based on three principles:

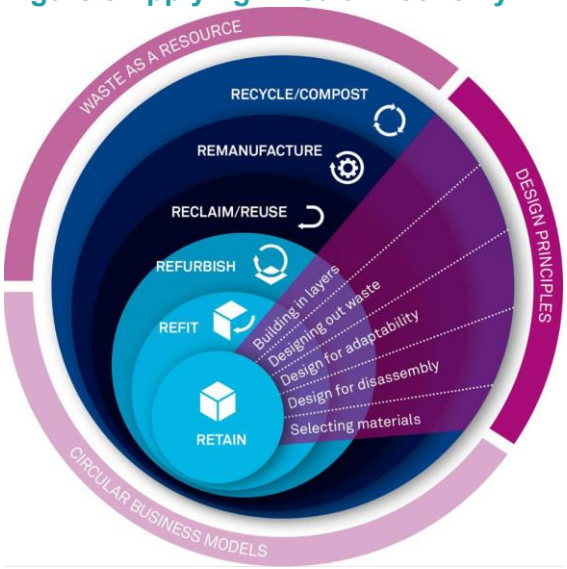
- Design out waste and pollution,
- Keep products and materials in use, and
- Regenerate natural systems.

5.4 This Report can help encourage a Circular Economy by:

- Influencing the wider design team to consider reclamation and reuse of waste/materials found on-Site to be incorporated in the proposed development, avoiding disposal of valuable materials, and
- Identifying reuse and re-processors companies for materials found on-Site, extending the products useful life before being remanufactured.

5.5 Figure 3 demonstrates the key stages and principles used when applying the Circular Economy to the built environment.

Figure 3 Applying Circular Economy Principles to Building Design[2]



6. Method

6.1 As stipulated by BREEAM, site visits were carried out by competent persons: '… who has appropriate knowledge of buildings, waste and options for reuse and recycling of different waste streams'.

6.2 Site visit was undertaken by Chartered Waste Manager Nafey Bin Afan and Building Surveyor Tom Lawrence on 13 October 2023.

6.3 This Site visit consisted of non-intrusive visual audits of building fabric to the external and internal parts of the buildings to be demolished.

6.4 Subsequently, a workshop was held with the Design Team dated 17 and 22 November 2023 to discuss the existing conditions of the buildings and the potential to reuse materials on-Site.

[2] Building Revolutions, David Cheshire, RIBA Publications 2016

Exclusion and Assumptions

6.5 The following assumptions, exclusions and caveats apply to this Report:

- It is assumed that 40% of the greenhouse building roof comprises of timber battens.
- It is assumed that 75% of the greenhouse building roof is covered by PVC screens.
- It is assumed that 30% of the shed roof is insulated.
- A 100mm thick concrete base is assumed throughout.
- Flat roof compositions are used, based on the information extracted from the visuals provided.
- This Report is based purely on the findings of a non-intrusive visual survey.
- Where clear line of sight/access was not available to attain measurements e.g., thicknesses, best judgement and assumptions have been made.
- Where areas of build frame were not visible, the size and lengths of the columns were assumed.
- Catering equipment that is free standing and not fixed to the structure, small power, data, and large specialist plants or any other mechanical, electrical, and plumbing (MEP) equipment are not considered within this Report.
- It is assumed that all furniture, equipment, and miscellaneous non-fixed items installed by the tenants will be removed by the tenants, therefore, these are not considered within this Report.
- No excavation has been considered for this Report including the removal of foundations.

6.6 The information provided within this Report is based on visual inspection (non-intrusive) of the existing Site. Where elements of the Site were inaccessible, assumptions are made based on professional judgement. It is understood that the quantities provided within this Report might vary, therefore, the principal contractor will be responsible for monitoring and reporting these changes (if any).

7. Materials Identified

7.1 The following section describes the key waste/materials identified, their location, and images taken during the Site visit. Based on the condition of the waste/materials and their market demand, a circularity rating (i.e., how likely is the material reused or recycled on/off-Site) for the waste/materials has been provided (based on professional judgement) to determine whether they can be reused, recycled, or sent for recovery or disposed to landfill as a last resort.

7.2 The circularity rating is based on the following key shown in Table 1. The ratings and related descriptions are recommendations for the waste management route of the materials identified; the exact routes for the materials will be determined by the appointed demolition contractor (when appointed).

Table 1 Circularity Rating

Key	Description
	Good condition and reuse of this material is possible.
	Wear and tear – this material is likely to be recycled. Alternatively, this indicator may be used if the material is in a good condition but there is no market for reuse and therefore must be recycled.
	Poor condition/not reusable or non-recyclable material, this may be due to several reasons such as there being no end market for the material to be recycled (e.g., composite materials) or due to the small quantity of the material present, which therefore makes it unviable to recycle separately. This material is likely to be sent to landfill or energy recovery.

Concrete

7.3 Please see Table 2 for the location, types and quantities of the concrete found on-Site.

Table 2 Location and Quantities of Concrete

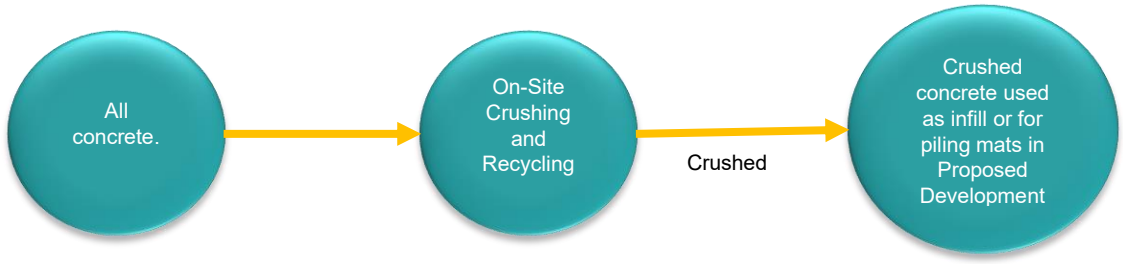
Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Concrete Slab (100mm)	69.29m^3	166.28
Hardstanding	Concrete Slab (100mm)	535.93m^3	1,286.22
Total		**605.22m^3**	**1,452.5**

General Observation

7.4 The concrete slabs were not visible; therefore, the condition of these materials is unknown.

General Recommendation and Limitations

All concrete will be sent to crushing facilities on-Site, which can later be used for pile mats or in-fill material.



Bricks

7.5 Please see Table 3 for the location, type and quantities of the bricks found on-Site. Image 3 shows some of the bricks found on-Site.

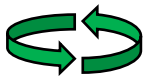
Table 3 Location and Quantities of Bricks

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Standard ½ brick wall (102.5mm)	0.10m^3	0.18
Total		**0.10m^3**	**0.18**

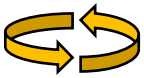
General Observation

7.6 Bricks were found to be in good condition.

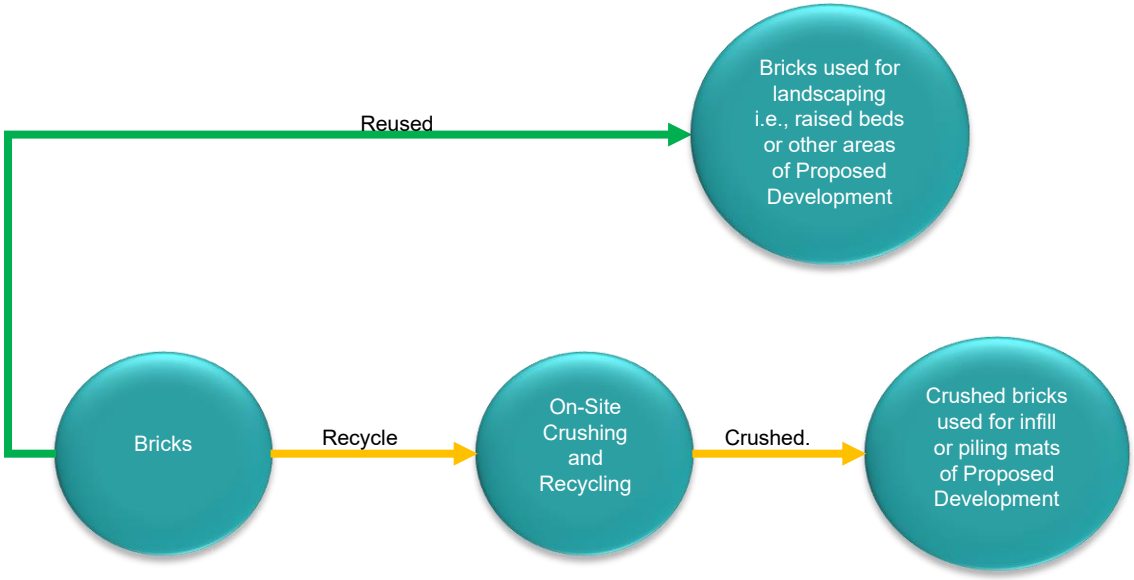
General Recommendation and Limitations



The bricks found on-site can be carefully removed and then reused for landscaping purpose i.e., raised beds. However, there are few barriers related to this process including bricks not matching the design of the Proposed Development due to its colour and bricks bound with cement mortar requiring cleaning and is labour intensive.



Alternatively, these bricks can be sent to a crushing plant (on-Site) and recycling centre, from where the crushed aggregate can be reused for piling mats or infill.



Images

Image 3 Bricks

Mixed Metals

7.7 Please see Table 4 for the location, type and quantities of the mixed metals found on-Site. Image 4 - Image 6 shows some of the mixed metals found on-Site.

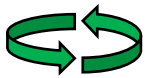
Table 4 Location and Quantities of Mixed Metals

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Structural Metals	4.87m^3	37.02
	Steel Columns	1.02m^3	7.75
Hardstanding	Steel CCTV Lighting Columns	0.63m^3	1.70
	Steel Main Entrance Gate	1.33m^3	3.59
Total		**7.85m^3**	**50.06**

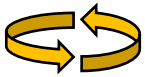
General Observation

7.8 The mixed metals found on-Site were noted to be in between reasonable to poor condition state i.e., the structural metals and the steel columns were found to be damaged in isolated areas, whereas the steel CCTV lighting columns were noted to be in reasonable condition.

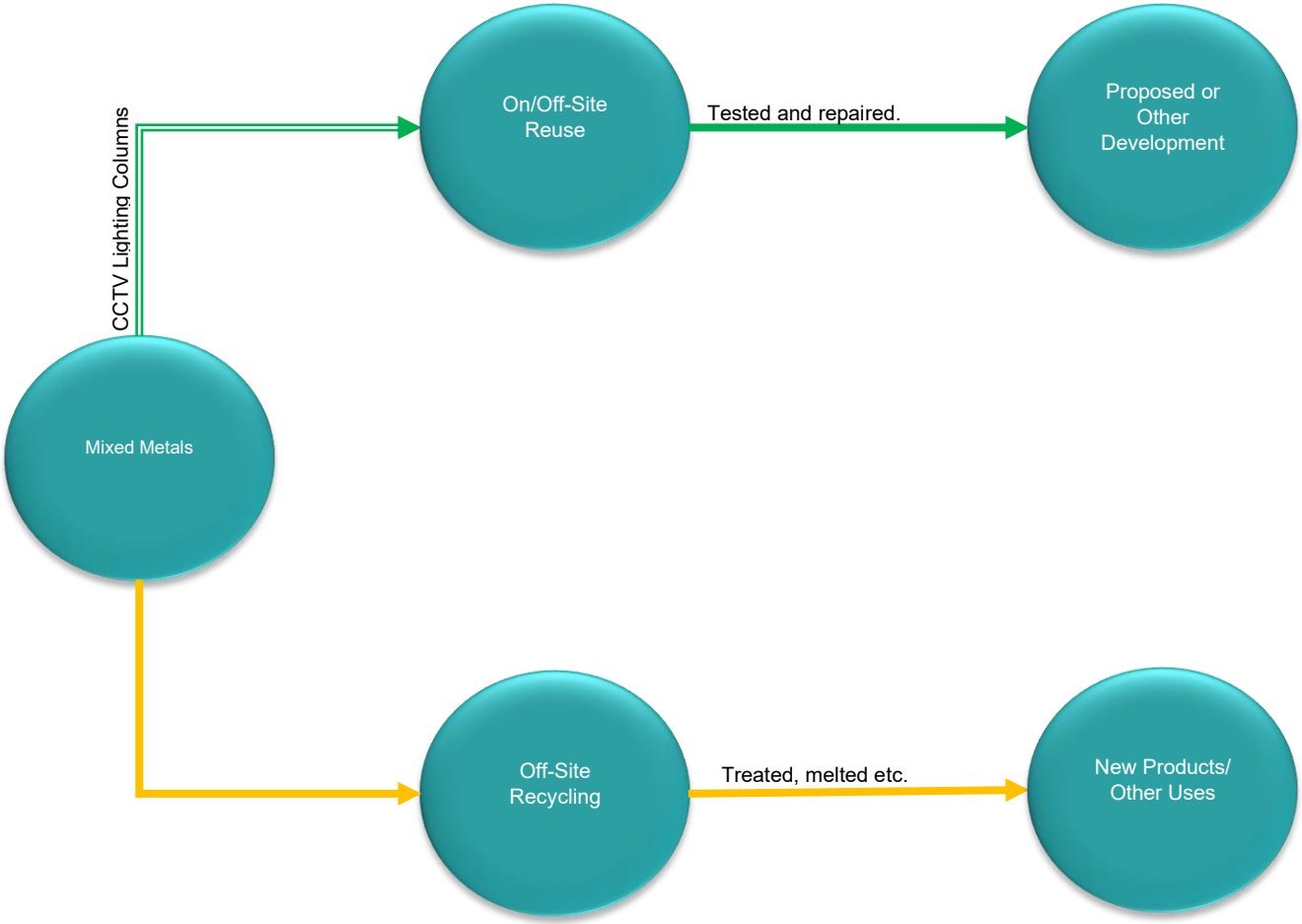
General Recommendation and Limitations



Based on further testing, the CCTV lighting columns can be reused on or off-Site.



Alternatively, all metals can be sent off-site for recycling.


CCTV Lighting Columns
On/Off-Site Reuse
Tested and repaired.
Proposed or Other Development
Mixed Metals
Off-Site Recycling
Treated, melted etc.
New Products/ Other Uses

Images

Image 4 Structural Steel

Image 5 Structural Steel and Columns

Image 6 CCTV Lighting Columns

Timber and Timber Products

7.9 Please see Table 5 for the location, types, and quantities of the timber and timber products found on-Site. Image 7 - Image 11 shows some of the timber and timber products found on-Site.

Table 5 Location and Quantities of Timber and Timber Products

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Oriented Strand Board (OSB) Timber Panels	0.50m^3	0.35
	Timber Columns	0.22m^3	0.15
	Timber External Walls (Shed)	1.36m^3	0.95
	Timber from Stud Walls	0.98m^3	0.69
	Structural Timber Roof (Shed)	2.16m^3	1.51
	Structural Timber Roof (Greenhouse Building)	4.05m^3	2.83
	Structural Timber Gable Ends	1m^3	0.70
Total		**10.27m^3**	**7.18**

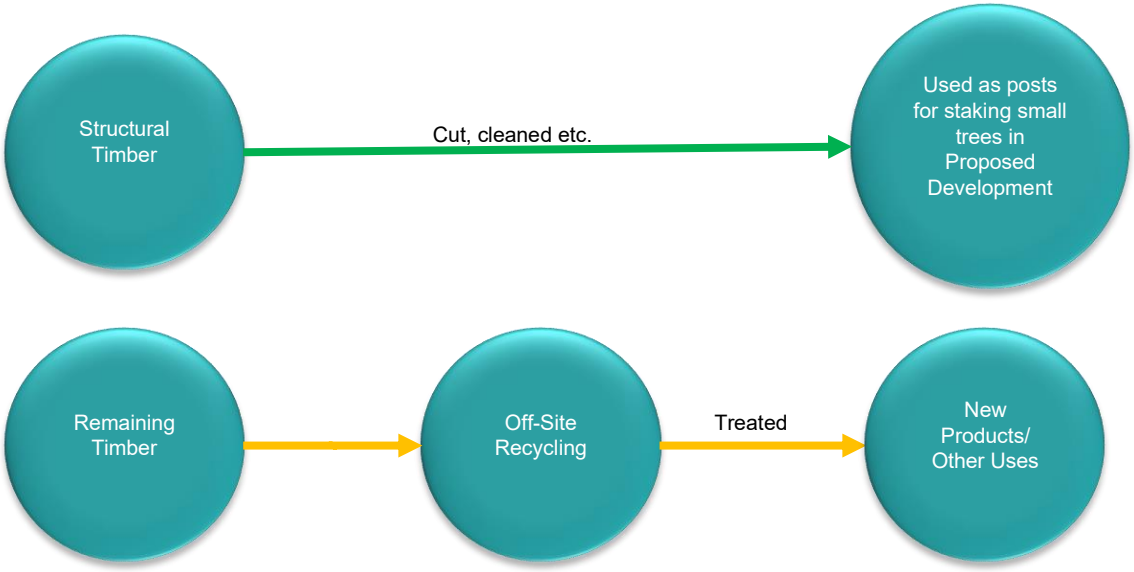
General Observation

7.10 The different timber and timber products found on-Site varied in condition. The timber external walls from the shed were heavily weathered and in poor condition. The structural time, gable ends and the OSB panels were found to be in reasonable condition.

General Recommendation and Limitations

Depending on the condition, the structural timber can be cut and reused as posts for staking smaller trees.

Alternatively, all timber items can be sent for off-Site recycling.



Images

Image 7 Timber External Shed Wall

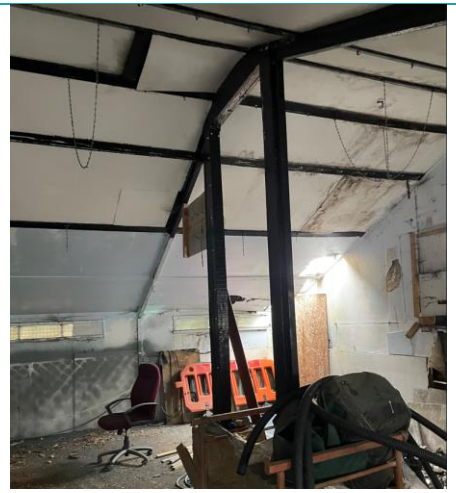


Image 8 Timber Columns

Image 9 Timber Stud Wall

Image 10 Timber OSB Panels

Image 11 Timber Gable Ends

Tiles and Ceramics

7.11 Please see Table 6 for the location, types, and quantities of the tiles and ceramics found on-Site. Image 12 shows the tiles and ceramics found on-Site.

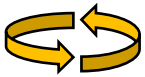
Table 6 Location and Quantities of Tiles and Ceramics

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Fibre Cement Roof Covering	4.32m^3	10.36
Total		**4.32m^3**	**10.36**

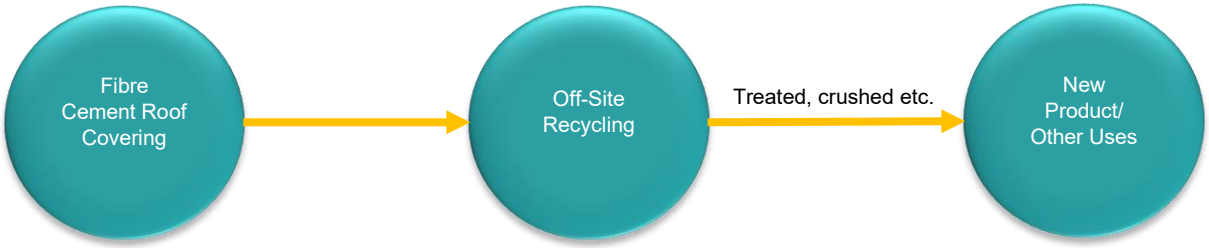
General Observation

7.12 The fibre cement roof covering is noted to be in poor condition.

General Recommendation and Limitations



These can be sent off-Site for recycling.



Images

Image 12 Fibre cement Roof Covering

Gypsum based construction material (including plasterboard)

7.13 Please see Table 7 for the location, types, and quantities of the gypsum based construction material (including plasterboard) found on-Site. Image 13 shows some of the gypsum based construction material (including plasterboard) found on-Site.

Table 7 Location and Quantities of Gypsum based construction material (including plasterboard)

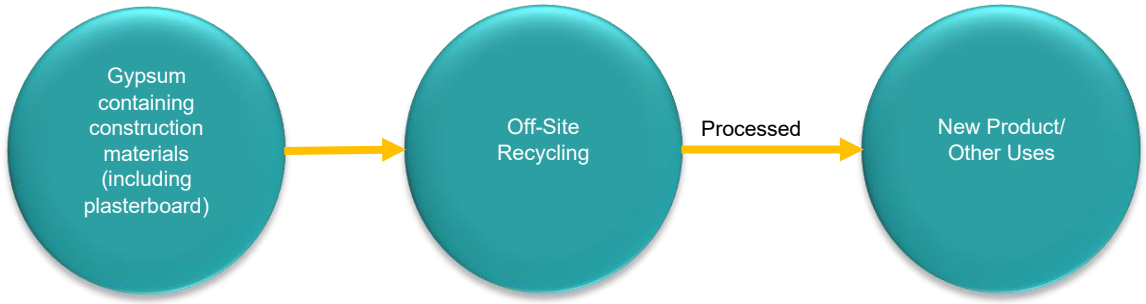
Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Plasterboard Stud Walls	3.31m^3	1.99
Total		**3.31m^3**	**1.99**

General Observation

7.14 The gypsum based construction material (including plasterboard) found on-Site was noted to be in poor condition.

General Recommendation and Limitations

All plasterboard will be sent off-Site for recycling.



Images

Image 13 Plasterboard Walls

Glass

7.15 Please see Table 8 for the location, types, and quantities of the glass found on-Site. Image 14 shows some of the glass found on-Site.

Table 8 Location and Quantities of Glass

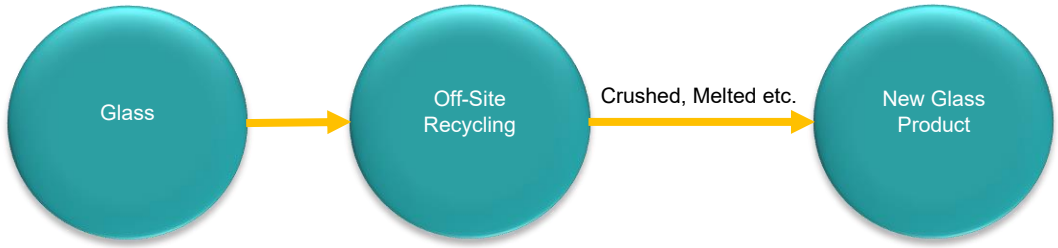
Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Single Glazed Window	1.41m^3	3.51
Total		**1.41m^3**	**3.51**

General Observation

7.16 Glass found on-Site was noted to be in poor condition.

General Recommendation and Limitations

Due to common barriers including joint components and potential low performance, all glass will be sent off-Site for recycling.



Images

Image 14 Single Glazed Window

Textiles

7.17 Please see Table 9 for the location, types, and quantities of the textiles found on-Site. Image 15 shows some of the textiles found on-Site.

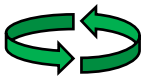
Table 9 Location and Quantities of Textiles

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Carpet	0.94m^3	0.57
Total		**0.94m^3**	**0.57**

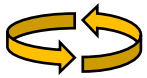
General Observation

7.18 The textiles found on-Site were noted to be in poor condition.

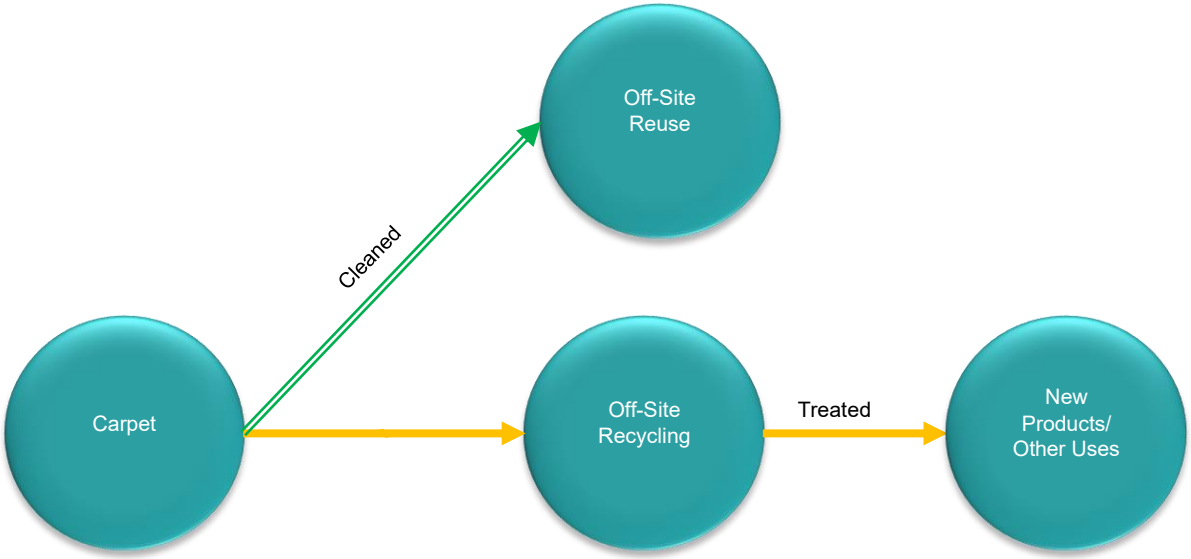
General Recommendation and Limitations



Carpets can be sent for reuse off-Site.



However, as these carpets are cut based on specific room sizes, it might reduce its potential to be reused, therefore, these will be sent off-Site for recycling.



Images

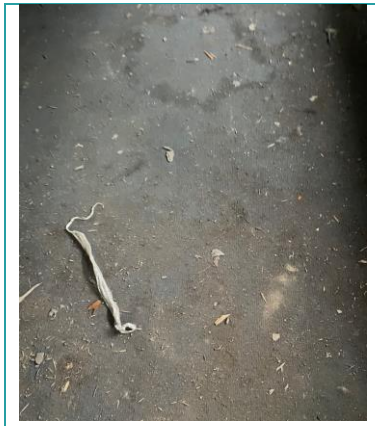


Image 15 Carpet Tiles

Plastics

7.19 Please see Table 10 for the location, types, and quantities of the plastics found on-Site. Image 16 - Image 18 shows some of the plastics found on-Site.

Table 10 Location and Quantities of Plastics

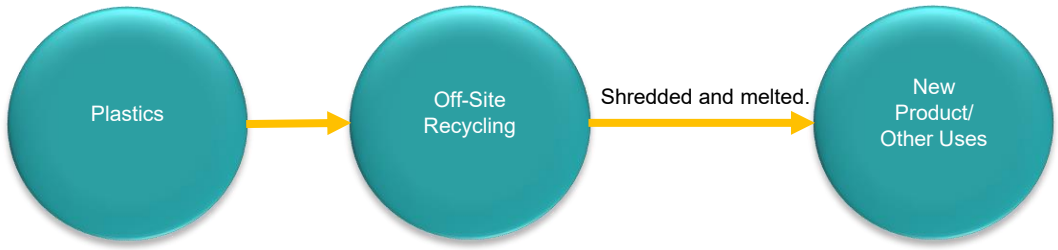
Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Vinyl Flooring	0.08m^3	0.05
	PVC Screen	0.16m^3	0.02
	PVC Gutters	1.63m^3	1.31
Total		**1.87m^3**	**1.38**

General Observation

7.20 Plastics found on-Site were noted to be in poor condition.

General Recommendation and Limitations

All plastics will be sent off-Site for recycling.



Images

Image 16 Vinyl Flooring

Image 17 PVC Gutters

Image 18 PVC Screen

Bituminous Mixtures (including asphalt, tarmac etc.)

7.21 Please see Table 11 for the location, types and quantities of the bituminous mixtures (including asphalt, tarmac etc.) found on-Site. Image 19 - Image 20 shows some of the bituminous mixtures (including asphalt, tarmac etc.) found on-Site.

Table 11 Location and Quantities of Bituminous Mixtures (including asphalt, tarmac etc.)

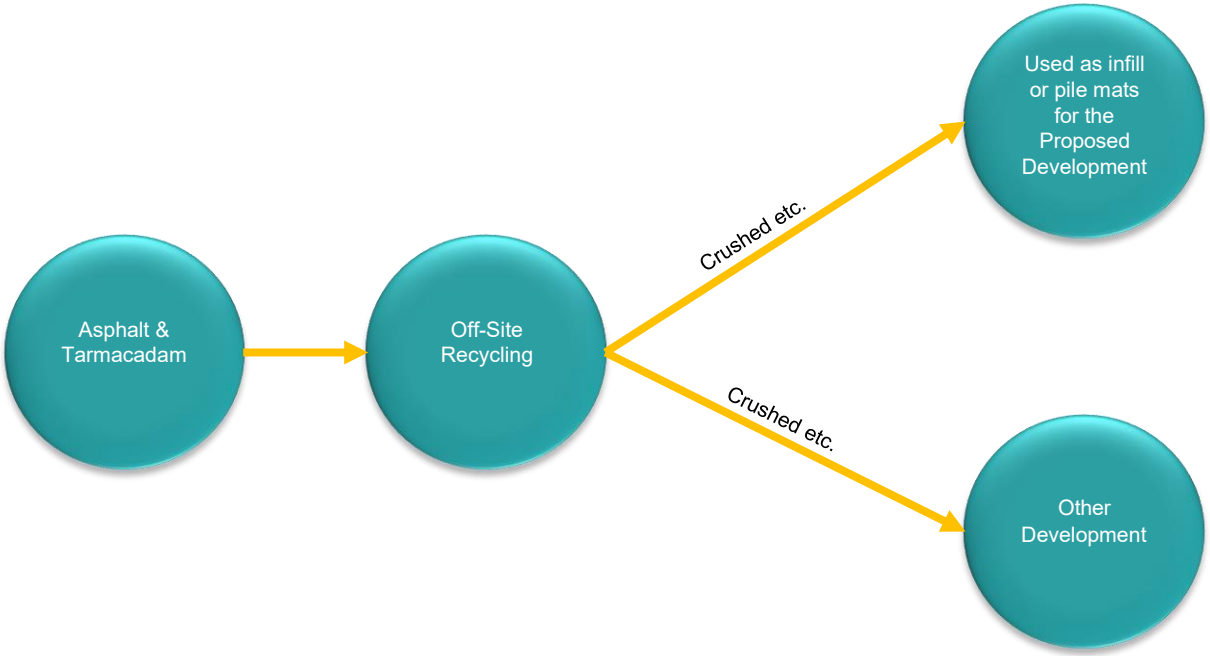
Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Hardstanding	Asphalt and Tarmacadam	222.96m^3	490.52
Total		**222.96m^3**	**490.52**

General Observation

7.22 The bituminous mixtures (including asphalt, tarmac etc.) found on-Site were noted to be in fair condition.

General Recommendation and Limitations

The bituminous mixtures (including asphalt, tarmac etc), can be sent to crushing facilities on-Site or off-Site, which can later be used for pile mats or in-fill material or used in the Proposed Development or another development.


Asphalt & Tarmacadam
Off-Site Recycling
Crushed etc.
Crushed etc.
Used as infill or pile mats for the Proposed Development
Other Development

Images

Image 19 Asphalt Hardstanding

Image 20 Tarmacadam Hardstanding

Rubber

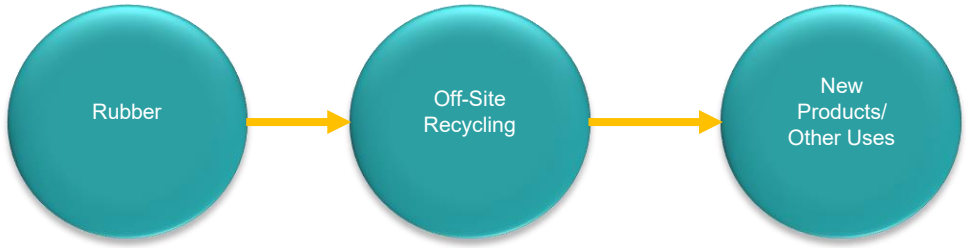
7.23 Please see Table 12 for the location, types and quantities of the rubber found on-Site. Image 21 shows some of the rubber found on-Site.

Table 12 Location and Quantities of Rubber

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Rubber Floor Tiles	0.75m^3	0.68
Total		**0.75m^3**	**0.68**

General Recommendation and Limitations

All rubber will be sent off-Site for recycling.



Images

Image 21 Rubber Floor Tiles

Insulation

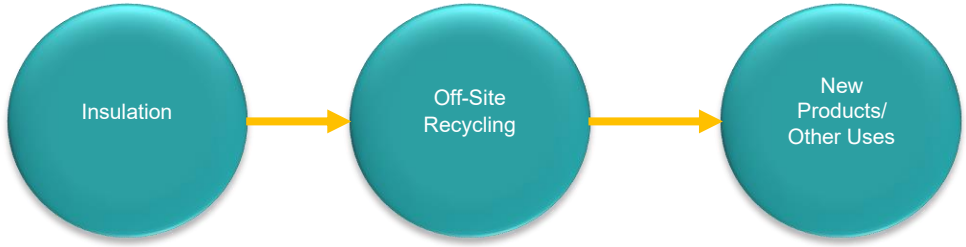
7.24 Please see Table 13 for the location, types, and quantities of the insulation found on-Site. Image 22 - Image 23 shows the insulation found on-Site.

Table 13 Location and Quantities of Insulation

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Shed + Greenhouse Building	Rock Wool Insulation (50mm)	11.05m^3	0.22
	Phenolic Foam Board (100mm)	4.05 m^3	0.08
Total		**15.1m^3**	**0.3**

General Recommendation and Limitations

All insulation will be sent off-Site for recycling.



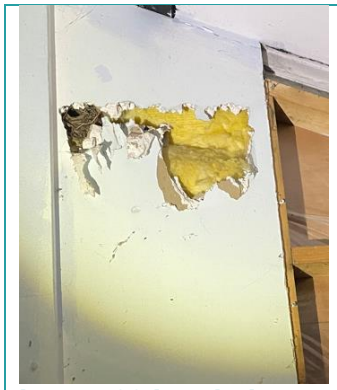


Image 22 Insulation

Image 23 Insulation

Luminaries

7.25 Please see Table 14 for the location, types and quantities of the luminaries found on-Site. Image 24 shows some of the luminaries found on-Site.

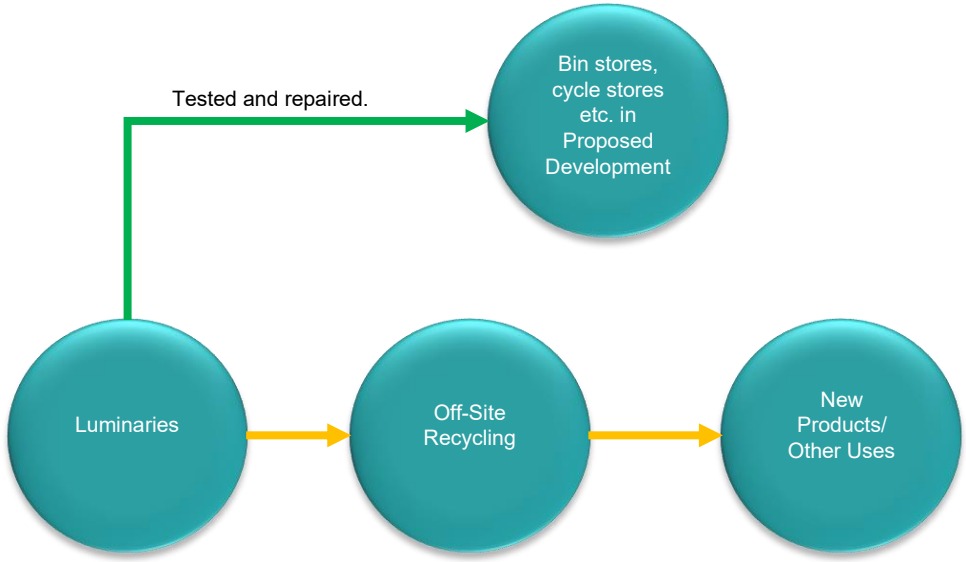
Table 14 Location and Quantities of Luminaries

Area/Location	Type	Approximate Quantity
Shed + Greenhouse Building	Incandescent Bulbs	6
Total		**6**

General Recommendation and Limitations

Subject to testing, some luminaries can be used in the Proposed Development for example in bin stores, cycle stores etc. Similarly, these can be sent off-Site to other developments where these can be reused (subject to testing).

All luminaries that cannot be reused on and off-Site will be sent off-Site for recycling.



Images

Image 24 Incandescent Bulbs

8. Estimated Quantities of Materials Identified

8.1 Estimated quantities of the materials anticipated to be generated during the demolition process are provided in Table 15. The estimated volumes are based on the Site visit and do not consider the actual skip volumes that may result from the Site (i.e., does not account for bulking and the inevitable voids within the skip during disposal). Figure 4 and Figure 5 shows the percentage breakdown of waste identified during the Site visit.

8.2 It should be noted that the recovery potential provided within Table 15 is based on the best practices as suggested by Waste and Resource Action Programme (WRAP). Therefore, this should be used as a reference only. Whereas the % of materials to be reused or recycled in Table 18 provides the quantities the design team intend to use on-Site.

Table 15 Estimated Quantities of Materials

Material	European Waste Catalogue Code (EWC)	Volume (m^3)	% of Total Volume (m^3)	Tonnes (t)	% of Total Tonnage (t)	WRAP Recovery Potential (%) (Best Practice) i.e., % diverted from landfill	Potential Recovery (i.e., m^3 diverted from landfill)	Disposal to Landfill/ Energy from Waste (m^3)	Potential Recovery (i.e., Tonnes diverted from landfill)	Disposal to Landfill/ Energy from Waste (Tonnes)	Potential volume (m^3) for Re-use / Recycling on-Site
Concrete	17.01.01	605.22	69%	1,452.5	72%	100%	605.22	-	1,452.5	-	100% recycle
Bricks	17.01.02	0.1	0.01%	0.18	0.01%	100%	0.1	-	0.18	-	100% reuse or recycle
Mixed Metals	17.04.07	7.85	1%	50.06	2%	100%	7.85	-	50.1	-	
Timber and Timber Products	17.02.01	10.27	1%	7.18	0.4%	95%	9.8	0.51	6.82	0.36	
Tiles and Ceramics	17.01.03	4.32	0.5%	10.36	0.5%	100%	4.32	-	10.36	-	
Gypsum based construction materials (including plasterboard)	17.08.02	3.31	0.4%	1.99	0.1%	95%	3.14	0.17	1.89	0.1	
Glass	17.02.02	1.41	0.2%	3.51	0.2%	100%	1.41	-	3.51	-	
Textiles	20.01.11	0.94	0.1%	0.57	0.03%	100%	0.94	-	0.57	-	
Plastics	17.02.03	1.87	0.2%	1.38	0.1%	100%	1.87	-	1.38	-	
Bituminous Mixtures (including asphalt, tarmac etc.)	17.03.02	222.96	26%	490.52	24%	95%	211.81	11.15	465.99	24.53	100% recycle
Rubber	04.02.09	0.75	0.1%	0.68	0.03%	100%	0.75	-	0.68	-	
Insulation	17.06.04	15.1	2%	0.3	0.01%	75%	11.33	3.78	0.23	0.08	
Total		**874.1**	**100%**	**2,019.23**	**100%**		**858.50**		**1,994.17**	**25.06**	

Numbers may not add up due to rounding.

Figure 4 Approximate Quantities of Materials (%) by Volume

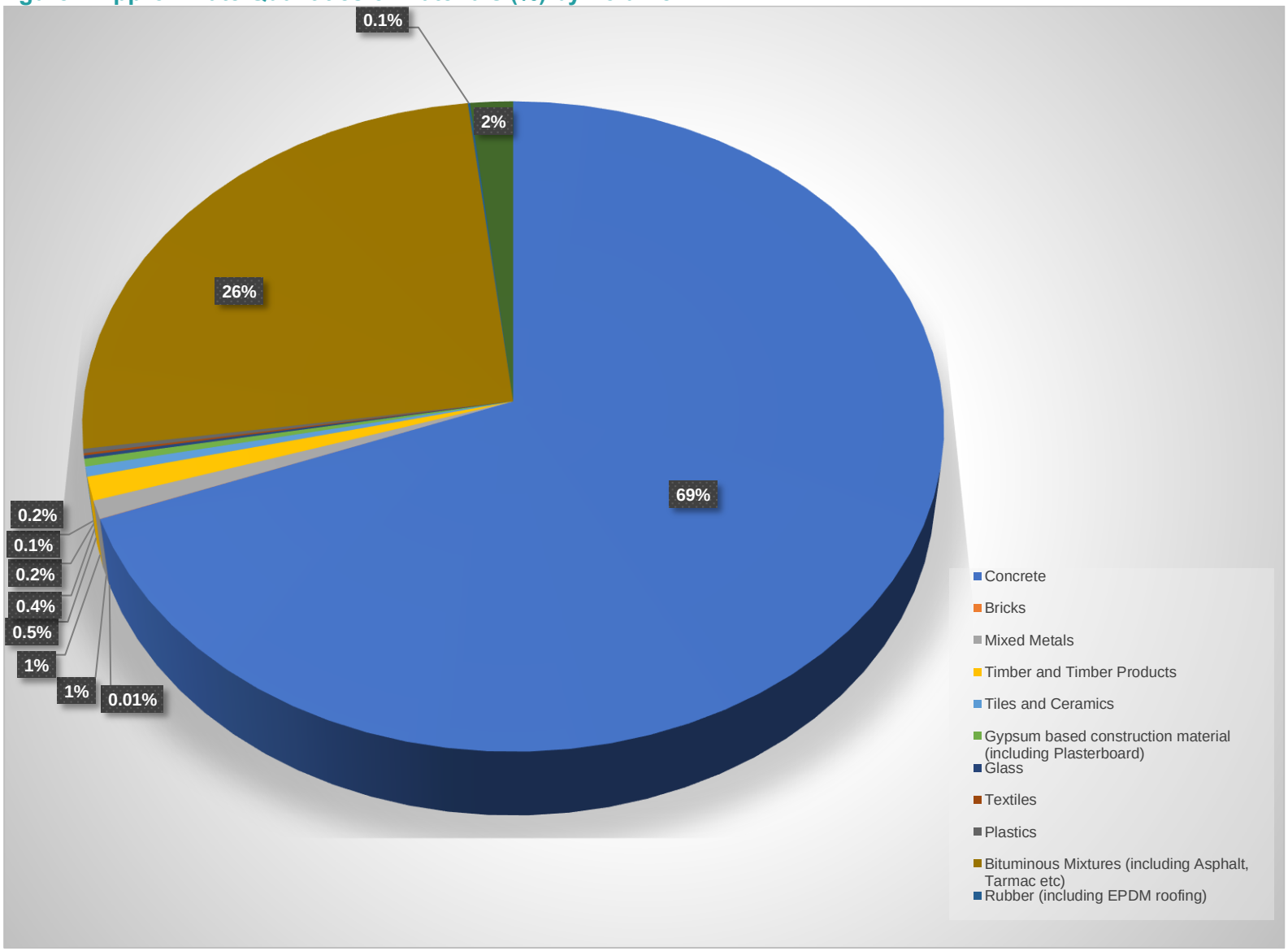
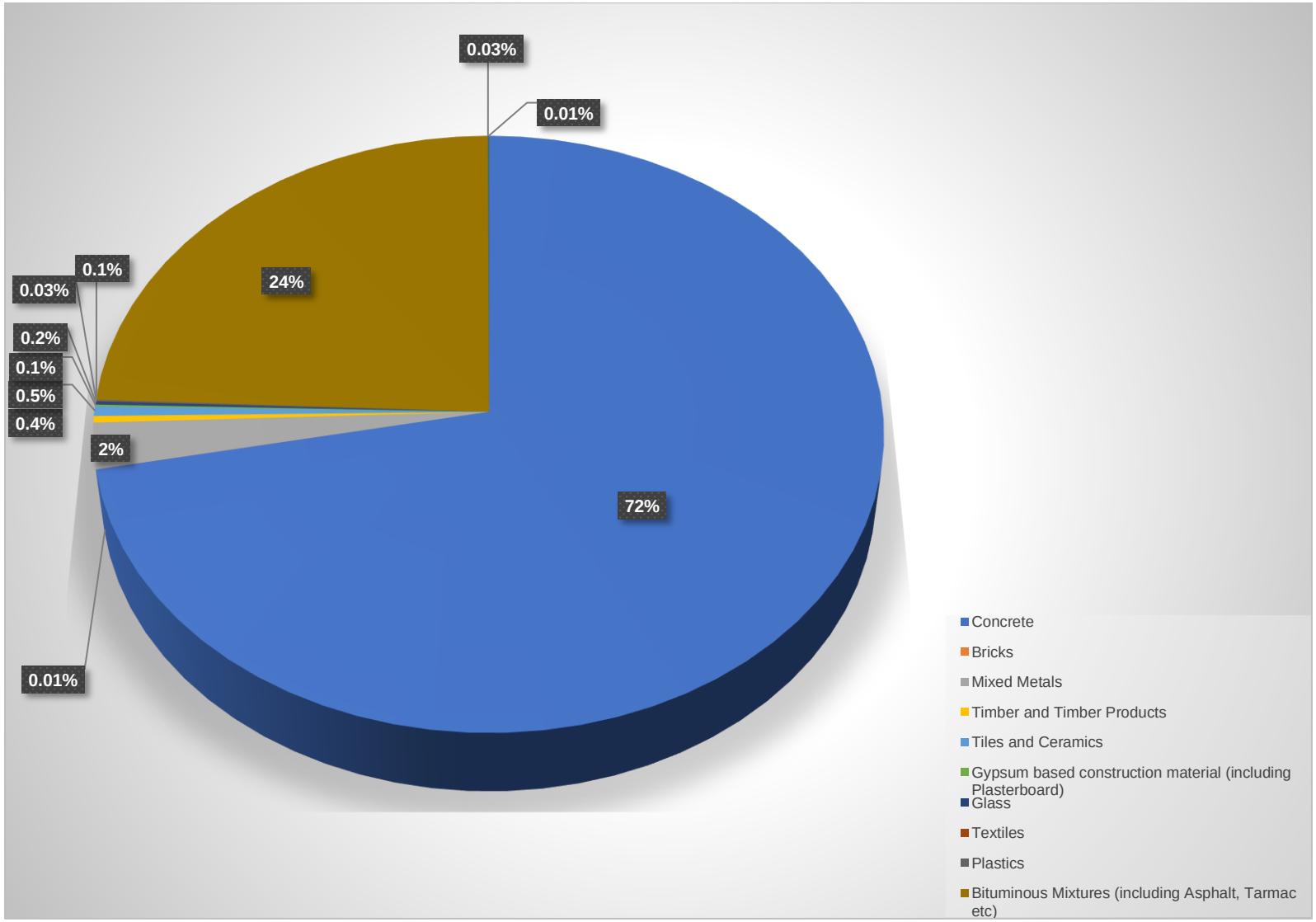


Figure 5 Approximate Quantities of Materials (%) by Tonnage



9. Embodied Carbon

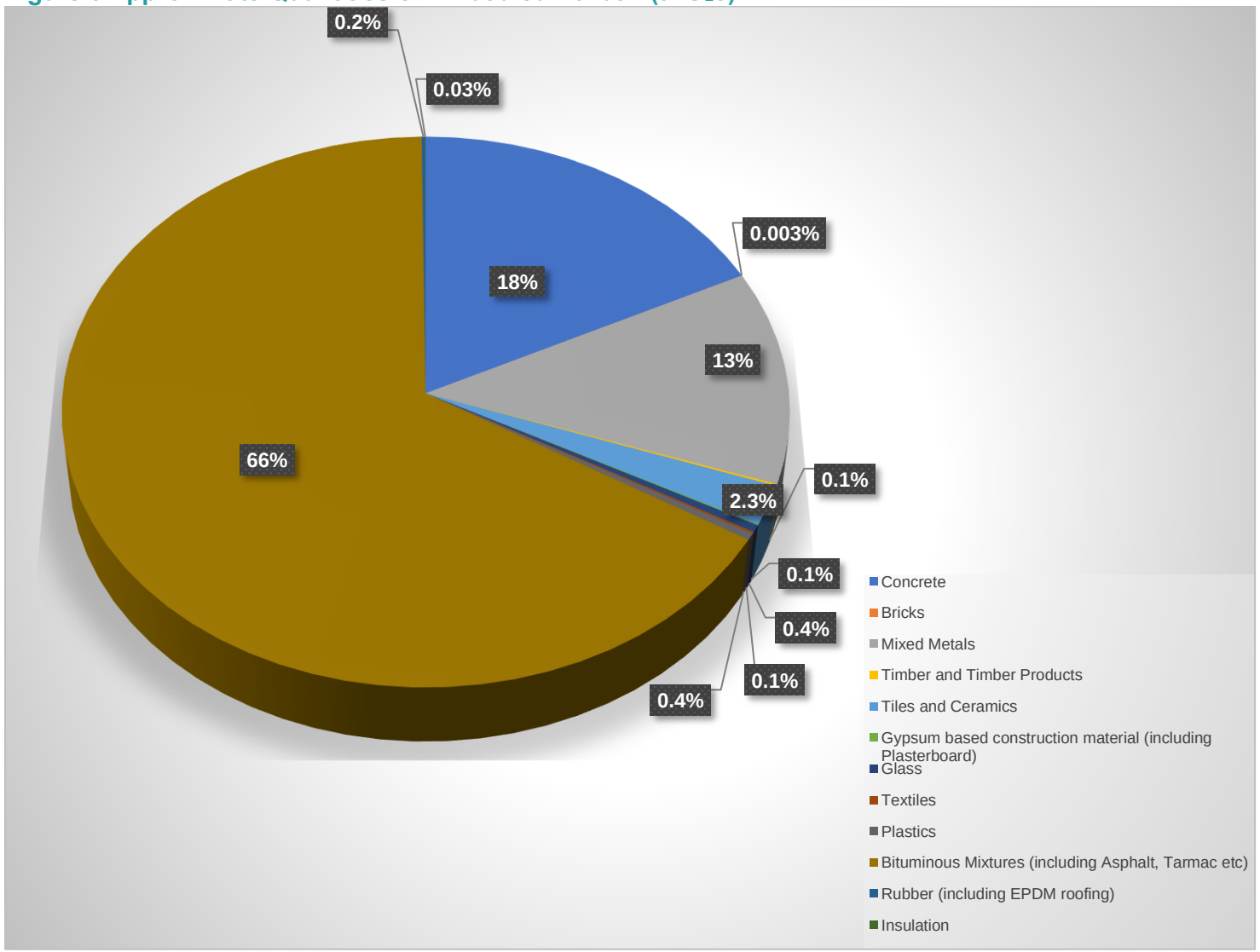
9.1 The approximate quantities of embodied carbon from the demolition materials have been estimated using Inventory of Carbon and Energy (ICE) database version 3. It should be noted that as the survey undertaken was non-intrusive, therefore, classification and identification of materials have been based on professional judgement, thus this should be used as a reference only.

9.2 Table 16 provides the potential quantities of embodied carbon (tCO_2e), which are further represented in Figure 6.

Table 16 Approximate Quantities of Embodied Carbon (tCO_2e)

Material	Approximate Quantity (t)	tCO_2e
Concrete	1,452.5	216.42
Bricks	0.18	0.04
Mixed Metals	50.06	153.48
Timber and Timber Products	7.18	1.28
Tiles and Ceramics	10.36	27.96
Gypsum based construction materials (including plasterboard)	1.99	0.78
Glass	3.51	5.06
Textiles	0.57	1.32
Plastics	1.38	4.68
Bituminous Mixtures (including asphalt, tarmac etc.)	490.52	809.36
Rubber	0.68	1.92
Insulation	0.3	0.34

Figure 6 Approximate Quantities of Embodied Carbon (tCO_2e)



10. Waste Reduction Opportunities

10.1 Workshop was held with the design team on 17 and 22 November 2023 (including but not limited to the structural engineers, landscaping architects etc). The purpose of these workshops was to discuss the condition of the existing buildings to understand whether these buildings or any components can be retained. Within these workshops information on the materials identified was also discussed along with the potential of reusing and recycling these materials during the redevelopment of the Proposed Development.

Targets

10.2 Based on the discussions held in the workshop, the following targets were agreed:

- Reuse and Recycle on-Site – more than 95 %
- Diversion from Landfill – at least 95%

10.3 The key provided in Table 17 has been adopted to show the opportunity of each material identified.

Table 17 Opportunity Key

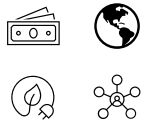
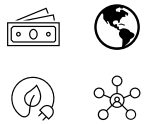
Key	Description
	Reduction in landfill costs
	Reduced environmental impact
	Less carbon/energy intensive
	Preserve natural resources
	Corporate social responsibility

10.4 Based on the discussions undertaken during the workshop, the potential opportunities for reusing and recycling the waste/material generated on-Site as well as the benefits of such initiatives have been identified in Table 18.

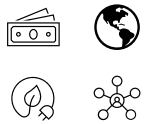
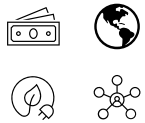
10.5 There are several opportunities to apply the waste hierarchy and Circular Economy to the buildings being demolished and examples of local reprocessing and recycling facilities have been identified, where appropriate, in this Report. However, these facilities suggested in Table 18 are not an exhaustive list. The final choices of the recommendations made within this Report will need to be determined by the demolition contractor, based on the costs and benefits of the options presented. There are clear benefits to implementing waste reduction initiatives, these include:

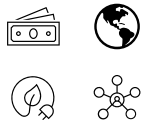
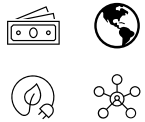
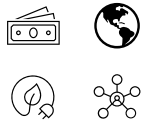
- Reducing costs associated with disposal,
- Realising financial benefits by diverting waste from landfill, and
- Environmental and social benefits of implementing the waste hierarchy and Circular Economy.

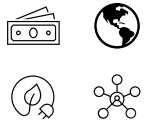
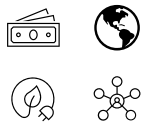
Table 18 Waste Reduction Opportunities

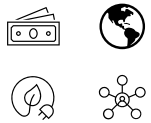
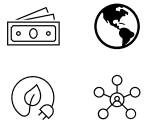
Material	Circularity Rating	Suggestion					Opportunity including cost saving due to diversion from landfill[3]	Constraints	Local Reprocessors
		on-Site Reuse	on-Site Recycle	off-Site Reuse	off-Site Recycle	Disposal			
Concrete		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 100% of this material will be crushed and used for piling mats or infill material.	It is understood that 0% of this material will be re-used off-Site	It is understood that 0% of this material will be recycled off-Site.	This material will not be sent for disposal.	 Potential Landfill Diversion Savings = £ 4,721	This will require additional storage space and potentially a license from Environmental Agency (EA) for storing this waste.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company
Bricks		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 100% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 0% of this material will be recycled off-Site.	This material will not be sent for disposal.	 Potential Landfill Diversion Savings = £ 1	This will require additional storage space and potentially a license from Environmental Agency (EA) for storing this waste	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company Globe Chain Globechain | Reuse Marketplace for Business Reuse Network Home - Reuse Network (reuse-network.org.uk) Windsor Reclamation

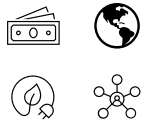
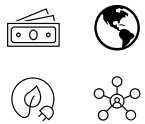
[3] The landfilling cost for this type of waste is based on lower rates i.e., for inert waste @£3.25 per tonne. Please note that this does not include any fee for collection or management. These numbers are for reference only.

									Reclaimed bricks - Windsor Reclamation (reclaimed-brick.co.uk)
Mixed Metals		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 100% of this material will be recycled off-Site.	This material will not be sent for disposal. Potential Landfill Diversion Savings = £ 163		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company EMR Get In Touch With EMR | EMR Metal Recycling Reimagined (emrgroup.com)
Timber and Timber Products		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 95% of this material will be recycled off-Site.	Approximately 5% of this material will be sent to disposal. Potential Landfill Diversion Savings = £ 23		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company Globe Chain Globechain | Reuse Marketplace for Business Reuse Network Home - Reuse Network (reuse-network.org.uk)

Tiles and Ceramics		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 100% of this material will be recycled off-Site.	This material will not be sent for disposal. Potential Landfill Diversion Savings = £ 34		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company Globe Chain Globechain | Reuse Marketplace for Business Reuse Network Home - Reuse Network (reuse-network.org.uk)
Gypsum based constructio n materials (including plasterboar d)		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 95% of this material will be recycled off-Site.	Approximatel y 5% of this material will be sent to disposal. Potential Landfill Diversion Savings = £ 6		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company
Glass		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 100% of this material will be recycled off-Site.	This material will not be sent for disposal. Potential Landfill Diversion Savings = £ 12		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company

									Globe Chain Globechain | Reuse Marketplace for Business Reuse Network Home - Reuse Network (reuse-network.org.uk)
Textiles		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 100% of this material will be recycled off-Site.	This material will not be sent for disposal. Potential Landfill Diversion Savings = £ 2		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company Globe Chain Globechain | Reuse Marketplace for Business Reuse Network Home - Reuse Network (reuse-network.org.uk)
Plastics		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 100% of this material will be	This material will not be sent for disposal. Potential Landfill		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste

					recycled off-Site.	Diversion Savings = £ 5			The Waste Co Best Construction Waste Removal Company UK - The Waste Company Globe Chain Globechain | Reuse Marketplace for Business Reuse Network Home - Reuse Network (reuse-network.org.uk)
Bituminous Mixtures (including asphalt, tarmac etc.)		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 100% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 0% of this material will be recycled off-Site.	This material will not be sent for disposal. Potential Landfill Diversion Savings = £ 1,595		This will require additional storage space and potentially a license from Environmental Agency (EA) for storing this waste	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company
Rubber		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 100% of this material will be recycled off-Site.	This material will not be sent for disposal. Potential Landfill Diversion Savings = £ 3		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company

									Globe Chain Globechain | Reuse Marketplace for Business Reuse Network Home - Reuse Network (reuse-network.org.uk)
Insulation		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 75% of this material will be recycled off-Site.	This material will not be sent for disposal. Potential Landfill Diversion Savings = £ 1		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste The Waste Co Best Construction Waste Removal Company UK - The Waste Company Globe Chain Globechain | Reuse Marketplace for Business Reuse Network Home - Reuse Network (reuse-network.org.uk)
Luminaries		Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be re-used on-Site.	It is understood that 0% of this material will be recycled on-Site.	It is understood that 0% of this material will be re-used off-Site	It is understood that 100% of this material will be	This material will not be sent for disposal.		Temporary storage required prior to sending this off-Site.	Reco Light Recycling Map | Recolight FREE lamp recycling

					recycled off-Site.				Enviromate Enviromate | Surplus Material | Community Projects Globe Chain Globechain | Reuse Marketplace for Business

10.6 Waste contractors in the area that collect multiple construction streams (segregated) are shown in Table 19. This list is not intended to be comprehensive, and waste generators will need to meet their legal duty of care by making sure that any waste produced is managed responsibly and only given to businesses authorised to take it. The presence of a company on the list below does not remove the requirement for waste generators to carry out their own duty of care checks.

Table 19 Waste Management Companies in London which collect multiple Construction, Demolition and Excavation (CD&E) Waste Streams

Waste Management Company
Capital Waste www.Capwaste.co.uk
GBN Services https://www.gbnservices.co.uk/construction-waste/
London Waste Removal Service www.Londonwasteremovalservice.co.uk/demolition
O'Donovan Waste Disposal https://www.odonovan.co.uk/
Junk Bunk Limited https://junkbunk.co.uk/
Swift Waste Management https://swiftwaste.co.uk/
Powerday https://powerday.co.uk/
Bywaters https://www.bywaters.co.uk/

11. General Guidelines for Management of Demolition Materials and Waste

11.1 This pre-demolition and pre-refurbishment audit have been conducted to allow material and waste management to be considered in the early stage of the project. The Applicant, Architect and Demolition Contractor should be involved in the material and waste management process from the offset. This will allow for effective planning to realise the value of materials on-Site and their subsequent management (i.e., consideration of the waste hierarchy).

11.2 The reuse of material on-Site or on a nearby similar project is the ideal option from an environmental and economic perspective. The Applicant and Architect are best positioned to consider these options and enable these initiatives. Doing so also often results in reduced transportation, reducing embodied CO_2 emissions and costs associated with material management on the project. To maximise this opportunity, it is advised that the following are considered:

- Opportunities for reuse on-Site,
- Safe storage of these items on-Site, in a separate storage area if feasible,
- Opportunities for reuse by the Applicant on other projects,
- Opportunities for reuse on local/similar projects,
- Advertisement of specific items on websites (e.g., www.salvo.co.uk),
- Contacting local architectural salvage merchants about specific items, and
- Selling or gifting items locally.

11.3 Waste arisings during demolition works should be continually monitored to provide a thorough understanding of the types and amounts of waste coming from the Site. This data collection will help with the continual improvement of material and waste management on-Site. Data collection can also be used to help set more demanding waste segregation targets for future demolition and refurbishment projects.

12. Recommendations and Next Steps

12.1 The type and quantities of material present on-Site have been identified, and opportunities to apply the principles of waste hierarchy and Circular Economy applied to different material types, with local reprocessing and recycling facilities identified. Ahead of construction works taking place, the following recommendations and next steps are suggested:

- Lifecycle analysis of new construction materials for the Proposed Development, in conjunction with the reuse/recycling of materials as identified in this Report.
- Embed the recommendations within this Report in the design process at pre-tender stage so the measures in relation to reuse and recycling targets are included in the awarded construction contract.
- Engagement with construction material suppliers to explore opportunities for takeback schemes.
- Where takeback schemes with suppliers are not possible, it is recommended that early engagement with reprocessing and recycling companies take place, to best capture recyclable materials and avoid downcycling.
- It is recommended that the materials identified within this Report are incorporated into a Site Waste Management Plan (SWMP)/Construction Resource Management Plan (CRMP) for effective management of waste. This is considered good practice on all construction projects and is a key step in facilitating diversion from landfill.
- Identify storage areas on-Site as appropriate for the types and quantities of waste anticipated to be produced during construction works. These areas should allow for the successful segregation of waste, as appropriate to avoid contamination of the different waste and material streams.
- All staff should have appropriate levels of training to enable the segregation of waste is achieved. Waste management information should be included within the Site induction for all personnel. It is recommended that a Reporting procedure SWMP/CRMP is put in place to catalogue the materials/waste produced, which is regularly updated. This will allow for the appropriate organisation of the transport for materials/waste on-Site and prevent stock piling.
- Further to this, it is recommended that a Waste Champion is nominated by the principal contractor to facilitate management of the SWMP/CRMP. This role would also aim to allow that the waste hierarchy is always considered, with the emphasis being on reducing, reusing, and recycling before landfill disposal is considered.

12.2 Once the principal contractor is commissioned to undertake the construction works, the following should be considered:

- The principal contractor should engage all contractors in the process of maximising high-grade reuse and recycling opportunities, and

- The principal contactor should refer to the Pre-Demolition and Pre-Refurbishment Audit Report in the SWMP/CRMP.

13. Further Information

13.1 In addition to the resources detailed in Table 19, further information pertaining to the sustainable waste management for construction projects can be found through the following sources:

- Bioregional, Reclaimed Buildings Product Guide: https://www.bioregional.com/resources/reclaimed-building-products-guide