Pre-Redevelopment and Pre-Demolition Audit Report

Project 200 East Development – University College School

University College School Hampstead

08/12/2023

Document Control

Version	Date	Comments	Author	Checked By	Verified By
V1	01 November 2023	First Draft Report	Nafey Bin Afan Resource and Waste Consultant	Nafey Bin Afan Resource and Waste Consultant	Kat Lees Resource and Waste Consultant
V2	08 December 2023	Second Draft Report	Nafey Bin Afan Resource and Waste Consultant	Nafey Bin Afan Resource and Waste Consultant	Kat Lees Resource and Waste Consultant
Final	08 December 2023	Final Report	Nafey Bin Afan Resource and Waste Consultant	Nafey Bin Afan Resource and Waste Consultant	Kat Lees Resource and Waste Consultant

Prepared For

University College School Hampstead

Prepared By

KaNect Limited
49 Gordon Road
Whitstable
Kent CT5 4NG
United Kingdom

www.kanectconsultancy.com

Table of Contents

Tables

Figures

Images

1. Executive Summary

1.1 This Pre-Redevelopment and Pre-Demolition Audit Report (hereafter referred to as 'Report') has been prepared by KaNect Limited (hereafter referred to as 'KaNect') in support of the proposed Project 200 East Development – University College School development (hereafter referred to as 'Proposed Development') located within the London Borough of Camden (LBC).

1.2 This Report has been prepared keeping into consideration the requirements and guidance set out in the London Plan and the Circular Economy Guidance. In addition to complying with the requirements and guidance as mentioned above, this Report also meets the requirements set out within LBC's planning guidance document 'Energy Efficiency and Adaptation (January 2021).

1.3 The key objective of this Report is to support the design team in exploring different options and approaches for retaining components (i.e., structural and non-structural) of the existing development in the design of the Proposed Development. Components of the existing development that cannot be retained and are decided to be demolished due to various reasons (as explained in the Report below) are then further analysed to develop an understanding of the types and quantities of material that would arise during the demolition activities, and whether this material generated during the demolition activities can be managed in line with the principles of waste hierarchy and circular economy i.e., promoting the reuse and recycle of these materials rather than disposal to landfill.

1.4 This Reports sets out the Applicants aspirations and commitment towards circularity and sustainability by setting targets that the Proposed Development will meet for the reuse, recycle and diversion of material from landfill including:

- Reuse and Recycle on-Site: approximately 58% of the demolition material to be reused and recycled on-Site, with the intention that the remaining materials are reused or recycled off-Site, thus limiting the quantities of material going to landfill.
- Diversion from Landfill: at least 95% diversion from landfill

1.5 In addition to the above requirements and targets, this Report will also assist the Proposed Development is obtaining BREEAM credits in the Wst 01 Construction Waste Management criteria.

2. Introduction

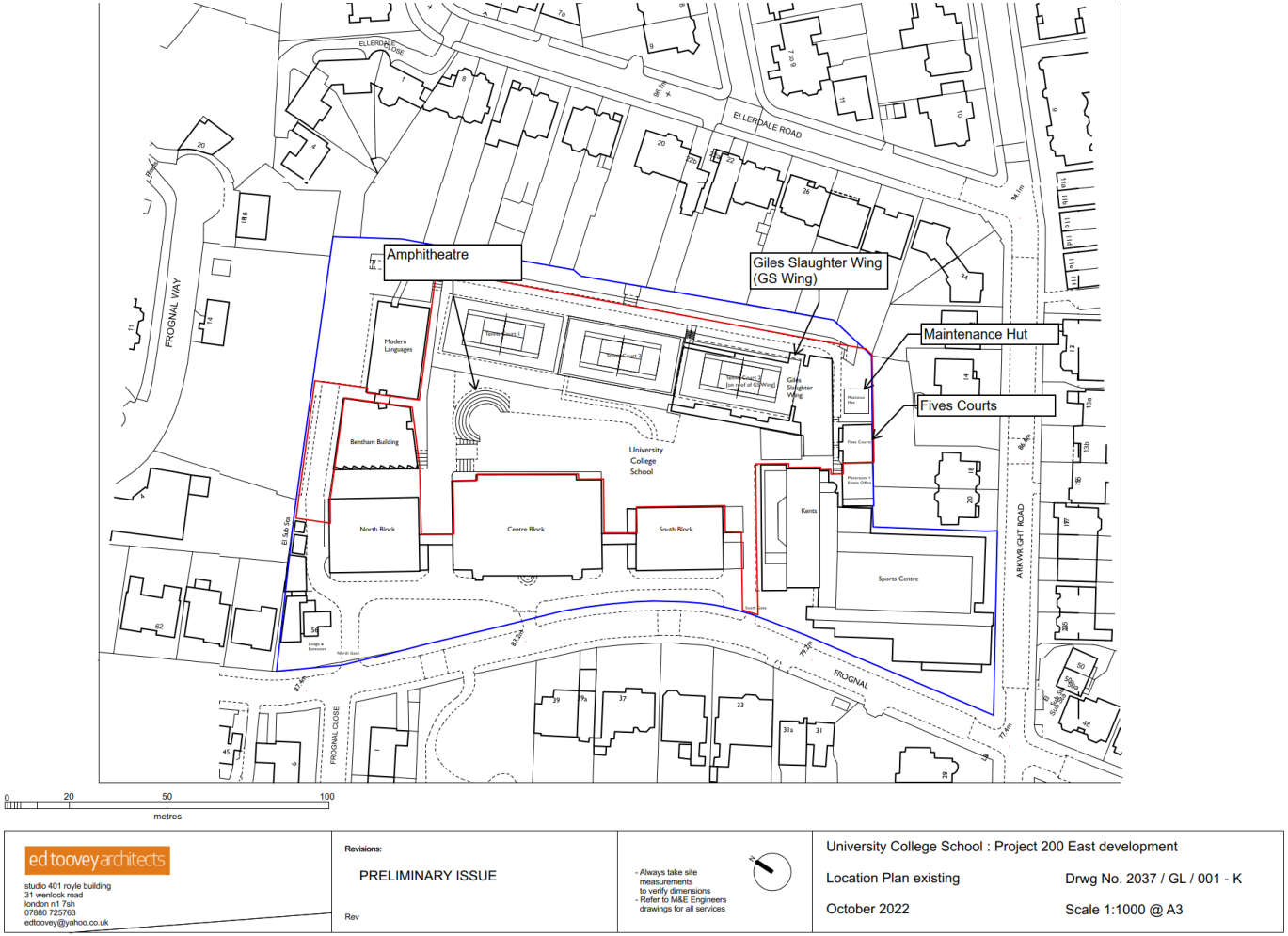
2.1 KaNect Limited (hereafter referred to as 'KaNect') has been appointed by University College School Hampstead (hereafter referred to as the 'Applicant') to prepare a Pre-Redevelopment and Pre-Demolition Audit Report (hereafter referred to as the 'Report') to support the proposed Project 200 East Development – University College School development (hereafter referred to as the 'Proposed Development'), located within London Borough of Camden (LBC).

2.2 It should be noted that the application site ("the Site") is part of the University College School (UCS) Frognal School site located in Hampstead. The west side of the Site is completely open to the public street, while the other three sides have residential properties.

2.3 It should be noted that there are 3 existing buildings on Site, including the Fives Courts, Maintenance Hut and Giles Slaughter Wing (GS Wing). In addition, there is an amphitheatre structure located on the external areas.

2.4 Figure 1 shows the site location plan.

Figure 1 Location Plan



This Figure is not drawn to scale.

2.5 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

2.6 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.

2.7 The extent of information 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.

3. Existing Site

3.1 As mentioned in paragraph 2.3, the existing Site comprises of 3 buildings. These include:

- **Fives Court**– is a dedicated Fives facility with 2 indoor courts, built on the southern boundary of the Site, with its south wall falling a part of the boundary. It is of simple materials and construction, brick walls and concrete floor faced with timber cladding on the north side, and steel and timber shallow pitch roof. This building is of basic poor construction and uninsulated and cannot be readily adapted for other uses. It is arguably at the end of its useful life. As such its location at a key area of the site inhibits an integrated approach to the new development, so as part of the proposals it is intended to demolish the building.
- **Maintenance Shed** – is a simple timber frame and timber boarded single storey building in the south-east corner of the school site. It is used for maintenance and storage and is essentially a temporary garden shed building on a concrete base slab.
- **Giles Slaughter Wing (GS Wing)** –was constructed in 1993-94 as part of a proposed masterplan for the whole of the eastern side of the campus. The building is single storey at ground level, with part of the roof used as a base for a raised tennis court at a similar level to the other 2 courts. At the back of the building is a narrow courtyard to allow daylight to the rooms from the east side, with a retaining wall to the garden terraces above which is also integral to the GS Wing building. On the southern side, the rooftop is much more complex, with various upstands for rooflights and walls, while at the east end there is an open mechanical ventilation plant area, part screened by mesh and timber beams. The building accommodates the Music department, practice rooms and teaching rooms, with other teaching classrooms, offices and a lecture room with tiered seating. The construction of the building is concrete floor and roof with load bearing masonry walls, and concrete piled retaining wall. Unfortunately, the building has, for several years since its opening, suffered from serious problems with waterproofing of the fabric and inadequate building services, which have required significant and costly maintenance, without solving the problems for the long term.

3.2 Image 1 - Image 4 provides some images of the buildings on-site.

Image 1 Fives Courts

Image 2 Maintenance Shed

Image 3 Maintenance Shed

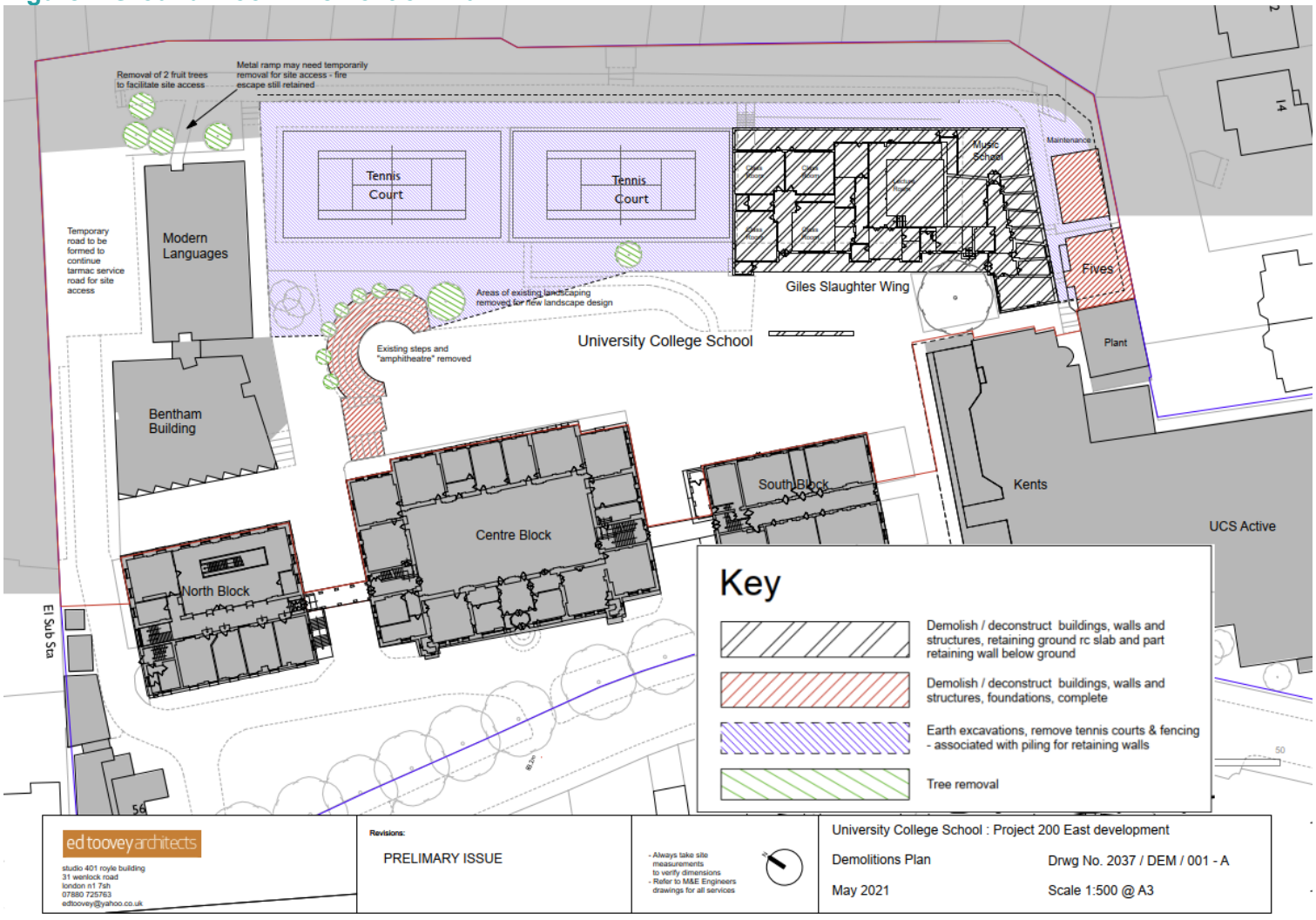
Image 4 GS Wing

4. Proposed Works and Justification to the adopted approach

4.1 As part of the proposed works, the Fives Courts, Maintenance Shed and Amphitheatre will be demolished including the ground floor slab. However, the ground floor slab and approximately 50% of the existing retaining wall structure will be retained for the GS Wing, whereas the remaining i.e., the superstructure (as associated elements) and the 50% existing retaining wall structure will be demolished.

4.2 Figure 2 shows the demolition plans.

Figure 2 Ground Floor – Demolition Plan



This Figure is not drawn to scale.

4.3 To establish whether the buildings on-site are suitable for retrofit or demolition, several considerations were made for each building. These considerations have been provided in this section below.

Fives Courts:

The building was constructed with its south wall on the boundary (its brick wall forming the boundary wall) and next to the original plantroom building. It is of single skin brick and block construction with timber cladding on the north side, uninsulated, with a lightweight steel and timber roof and felt coverings. Internally the finishes are simple, painted masonry. Services are very simple and cannot be re-used.

Due to the reduction in use, one of the courts has been converted into a temporary Drama Studio to supplement the teaching facilities in the adjacent Kents building, where the main Drama Lund theatre is located. However, it is a poor space for teaching and well below the general standard of accommodation at UCS, it is neither accessible to wheelchair users, nor compliant with current standards for teaching.

Although it has been used temporarily for drama as noted because severe shortage in teaching space has necessitated a radical approach, the building is not flexible or adaptable in practical terms and is located at a higher ground level compared to the GS Wing so cannot coordinate with it and access is via a narrow set of back steps.

In terms of the site, the building blocks access to the south and east areas in terms of making an efficient development and prevents achieving the area and brief that the school requires, particularly with regard to Drama and Cafeteria spaces.

The Fivess building, being on the boundary, does impact on the amenity of the rear garden to no.18 Arkwright Road by its physical bulk and massing, and there is an opportunity to improve the relationship between UCS buildings and the garden by the proposed new development, which is set back further from the south boundary at the first floor.

Maintenance Hut

The Maintenance hut is a “garden shed” type of construction, of timber cladding and structure but not intended for the long term. It is not of suitable construction for a teaching building in any sense. Its location prevents efficient use of the south land area and will obstruct development of the double height Recital Room, which is one of the most important components of the brief.

GS Wing

The GS Wing was constructed in 1993 to a significantly lower standard of thermal insulation and airtightness. The interior is now dated and not in accord with modern teaching standards. It is of masonry cavity external wall construction with brick outer leaf, 50mm cavity (with minimal if any insulation) and solid blockwork inner leaf; polyester powder coated (ppc) aluminium windows and doors and asphalt flat roof finishes. It has a concrete floor slab, part coffered roof slab and solid block load-bearing walls. There is a screened enclosure at rooftop level for plant and services equipment, which stands out particularly as lowering the standard of design, but the whole of the roofscape is of similarly functional but poor quality.

Since its construction the building has been bedevilled by construction problems, in particular water ingress from the oof and from tanked retaining walls, it therefore has a history of maintenance repairs associated with lower quality standards of build.

The design of the building allows for a tennis court at roof level, but not at the same height or alignment as the two courts built on the raised ground adjacent. On the west side the main frontage is completed with a colonnade of masonry and steel columns, supporting a steel frame canopy structure that is fully glazed with clear patent glazing units. This frontage was conceived as part of a consistent masterplan design approach that would have occurred all along the east garden side of the play area and on the south side too, down as far as the sports centre (which was also part of the masterplan proposal). Only the GS Wing was built, and later developments chose to ignore the precedent and masterplan design in favour of buildings of more contemporary style and substance, such as the new UCS Active Sports Centre built in 2005-2006 to the design of ORMS Architects. The colonnade was overly dominant, repetitive, and heavy, in a port-modern style that has dated poorly. Instead of the natural stone used on the original listed buildings, for example, the GS Wing frontage has precast concrete reconstituted stone, which does not have the same quality or weathering over time.

In the south area, that is not under the tennis courts, there is the possibility to have larger volumes and heights of spaces as well as an additional level, to permit purpose-designed spaces that the school requires in their brief. These include the Drama Studios, Cafeteria and in particular the music Recital Room. The Recital Room needs to have excellent acoustics and a specified reverberation time that requires a volume of at least double height, and preferably 2.5 times height, to create the necessary volume.

The GS Wing building has a complex and stepping roof slab, with various openings for rooflights and services, and changes of level. The option was explored to add an additional flat reinforced concrete slab on top of this to create a second level of accommodation, however, this was not feasible, adding much more weight to the structure, and creates a void between the floors, it does not allow the tennis courts to be on the same level. The existing roof slab also precludes the feasibility of a double hight space such as is required in the brief.

The roof slab is of a coffered construction, deep overall, with intermediate flat beam lines, so the coffers determine where walls can be located visually and structurally. Points of support that are not on these beam lines will be extremely difficult to create and will visually cut across coffers.

The GS Wing building has load-bearing masonry walls that are specific to the current layout. This means that the building is inherently inflexible and extremely difficult to alter plan layouts.

The current plan layout, although originally designed for a music department, does not fulfil the brief of the school, or match modern music teaching requirements, for example practice rooms are generally too small, there is no rock/recording studio etc. The structural engineer has looked at the implications of changing layout and the modifications would be impractical due to disruption and number of interventions with new posts and beams below.

Existing interior spaces in areas that do not have external windows are poorly ventilated. The building has history since construction of being poorly ventilated and of breakdowns in services. This may be due to the very tight plant space at the rear (east) side.

The building has reasonable external glazing to the west front, but on the east side there is only a very narrow lightwell that cannot be improved. Rooms facing this lightwell have a very poor quality of daylight.

The GS Wing has a complex plan shape which further limits its flexibility for other uses and layouts [combined with inflexible layout of walls.

The existing music rooms are very poorly designed for sound separation and absorption, and do not meet modern standards for schools as set out in BB 93. To alter the interiors to meet current standards would mean adding layers of dry-lining boarding and losing floor area, adding layers of acoustic absorption, and losing room height. In both cases this will worsen the issues of flexibility and fitness for purpose to meet the school brief.

The GS Wing building has low floor finished floor level (FFL) to soffit heights compared to modern standards, ranging from an exceptionally 2.4m in some areas to 2.7m in larger areas. This height is to concrete roof slab underside, so cannot be improved. The structural engineers did consider an option to lift the slab up and re-support, but this was found to be impractical. By comparison the proposed new build areas of the new design have floor to soffit height of 3.45m, this being to allow for ventilation services and ductwork, other building services, as well as providing generous room heights. History has proven with urban development especially that buildings with generous soffit/ceiling heights are more flexible over time for change of use.

The GS Wing size and location is a hindrance to fully developing the available land on the school campus. The Frognal campus does not have very spare land available for development in the future, it is constrained for a school of this size, and external play and amenity areas must not be compromised – they are of equal value as the teaching spaces. To the south and east of the GS Wing there is an area of land of approximately 360 sqm that has been included in the project proposals, land that is currently effectively under-used and wasted. However access to this area for construction will be impractical if the GS Wing is retained in full, as there is no space for vehicles or plant between building and the existing nature “Queen’s “Oak tree adjacent, which requires protection. With the upper superstructure, columns and roof slab deconstructed, the deep ground slab can be used for construction vehicle and plant access and the problem no longer arises, so the whole scheme can use the land much more efficiently.

With the existing roof slab retained the first floor cannot practically be developed with an additional storey, so important elements of the brief cannot be accommodated and there would be no future feasible way to add later.

The proposed development is seen as a long-term building for the site. The school was founded in 1830 and moved to this site into the new buildings in 1906, so it has a history of nearly 120 years on the Frognal campus. The school is committed to this location and regards itself as serving a local community. This building proposed is seen as a facility that can last for a significant period comparable with the listed buildings on site, even if the uses internally change.

If the roof slab is maintained the tennis courts and play area cannot be all aligned together, either in plan or in level / section. This will limit the flexibility of the play space and complicate access, especially for disabled users. By contrast in the new proposals the courts / play area is all aligned on one level and the perimeters match all together.

With the existing roof slab this will limit the feasibility of providing upper-level biodiverse planters that are proposed in the new building.

Approximately 50% of the existing retaining wall is proposed for re-use. The other 50% is on the south-east and south sides, and their retention inhibits development of the south and east area of spare land available on the campus. The retaining wall line passes through the planned location of the Recital Room and the whole south block. By removing this section of retaining wall the further land to the south is made available for development and the proposals are more efficient.

Amphitheatre

The amphitheatre area is a stepped retaining construction that creates a near semi-circular seating area. The precedent historically is the Greek outdoor theatre, but this one is constructed in RC concrete and reconstituted stone concrete paving and steps, and its location has no relationship to the setting or listed buildings. It was part of the “classically inspired” post-modern Masterplan project that included the GS Wing.

Although intended as an outdoor performance area, it has seldom been used that way and is now only used for casual seating at play and break time. It occupies a large area that could be better used for play, landscaping and social spaces.

5. Aims and Objectives

5.1 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.

5.2 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.

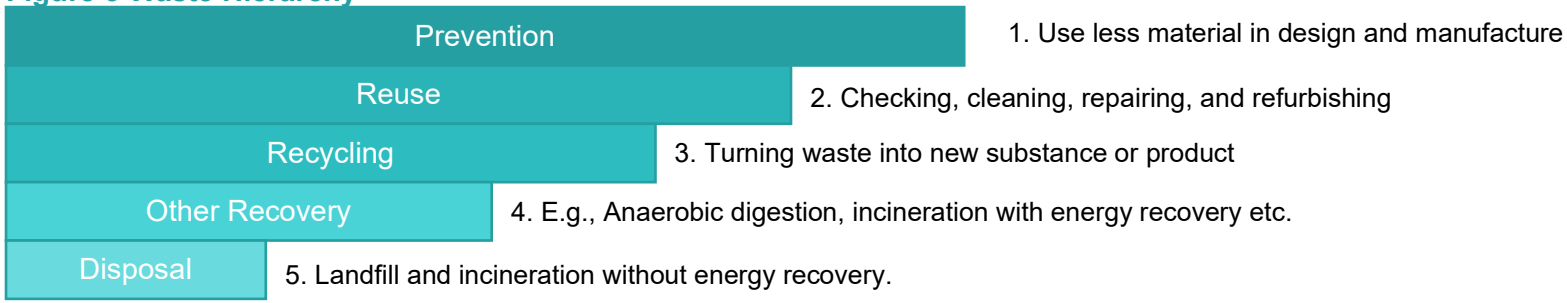
6. Key Principles

The Waste Hierarchy

6.1 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.

6.2 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 3.

Figure 3 Waste Hierarchy[1]



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

The Circular Economy

6.3 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:

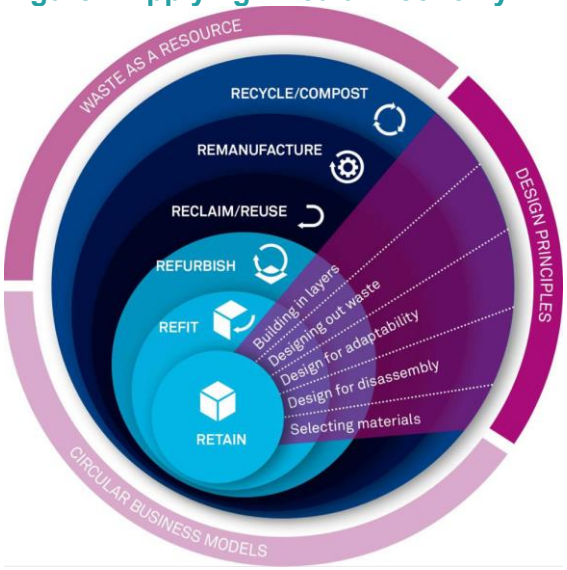
- Design out waste and pollution,
- Keep products and materials in use, and
- Regenerate natural systems.

6.4 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.

6.5 Figure 4 demonstrates the key stages and principles used when applying the Circular Economy to the built environment.

Figure 4 Applying Circular Economy Principles to Building Design[2]



7. Method

7.1 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'.

7.2 Site visit was undertaken by Chartered Waste Manager Nafey Bin Afan and Building Surveyor Tom Lawrence on 29 August 2023.

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

7.4 Subsequently, a workshop was held with the Design Team 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

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

- 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.
- All facing bricks elevations are assumed to be brick/cavity installations.
- 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.
- The walls for Fives Courts are assumed to be standard solid masonry rendered with concrete.
- The roof substructure for Fives Courts is assumed to be standard timber beam and slat flat roof.
- No excavation has been considered for this Report including the removal of foundations.

7.6 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).

8. Materials Identified

8.1 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.

8.2 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

8.3 Please see Table 2 for the location, types and quantities of the concrete found on-site. Image 5 - Image 8 shows some of the concrete found on-site.

Table 2 Location and Quantities of Concrete

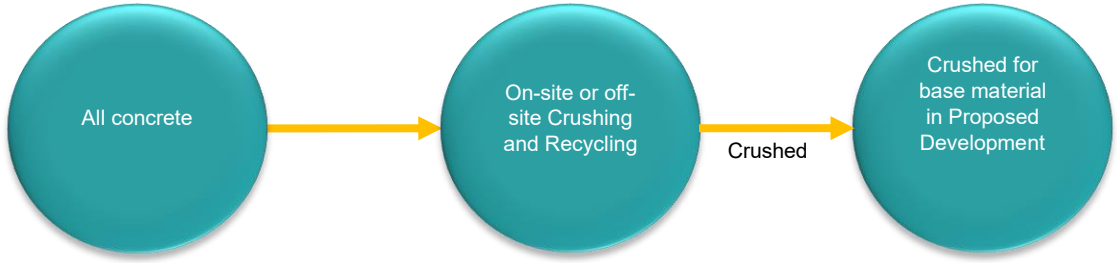
Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Fives Courts	Concrete Slab 200mm	4.84	11.62
	Concrete Slab 250mm	45.90	110.16
Maintenance Shed	Concrete Slab 200mm	11.84	28.43
GS Wing	Concrete Slab 300mm	186	446.40
	Medium Density Blockwork	52.23	78.35
External Areas	Concrete Slab 45mm	2.21	5.31
	Concrete Slab 65mm	5.72	13.73
	Concrete Coping Stone	0.70	1.68
	Concrete Borders	0.43	1.02
	Concrete Benches	0.30	0.72
	Concrete Stairs	5.70	13.68
Total		**315.87**	**711.1**

General Observation

8.4 There is a large quantity of blockwork throughout GS wing. It was all found in good condition with no obvious defects noted. All the buildings have a ground bearing slab. This was unseen therefore condition cannot be determined. Concrete slabs throughout the majority of GS wing roof walkway and stairs were in fair condition.

General Recommendation and Limitations

All concrete will be sent to crushing facilities on-site or off-site, which can later be used for infill.



Images

Image 5 External Areas - Concrete Coping Stone

Image 6 External Areas - Concrete Borders

Image 7 External Areas - Concrete Benches

Image 8 External Areas - Concrete Stairs

Bricks

8.5 Please see Table 3 for the location, type and quantities of the bricks found on-Site. Image 9 - Image 13 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)
Fives Courts	Solid Bricks	60.76	109.37
GS Wing	Solid Bricks	44.51	80.11
External Areas	Standard ½ Brick	0.96	1.73
Total		**106.23**	**191.21**

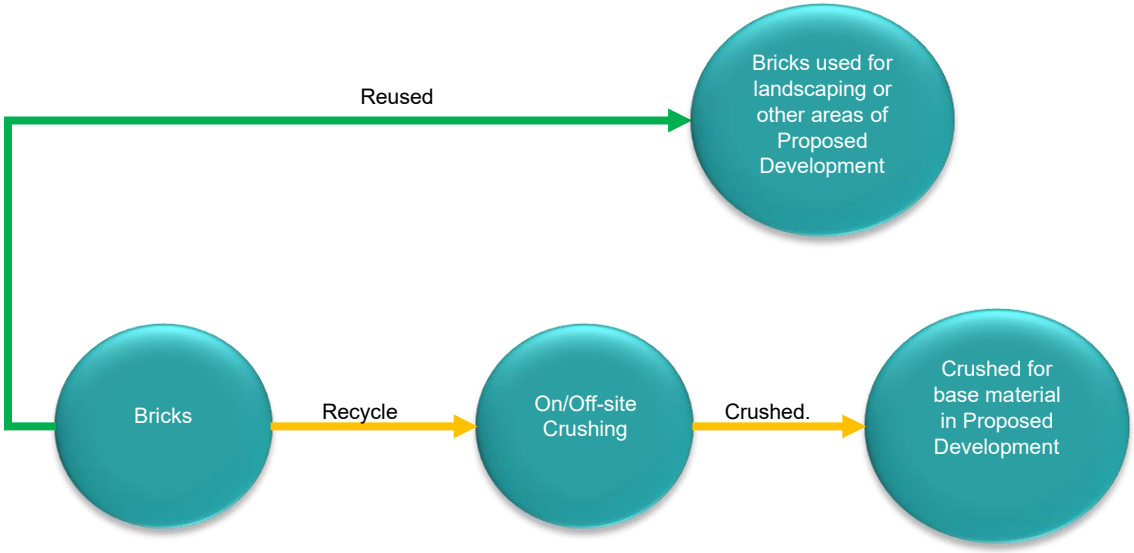
General Observation

8.6 All brickwork was found to be in good condition with only minor hairline cracks noted.

General Recommendation and Limitations

The bricks found on-site that are not matching that of other buildings within the Proposed Development can be carefully removed and then reused for landscaping purpose. 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 or off-site, from where the crushed aggregate can be reused for infill.



Images

Image 9 Fives Courts - Solid Bricks

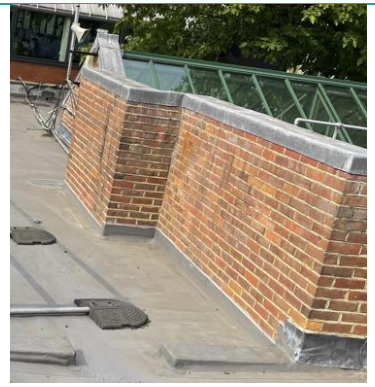


Image 10 GS Wing - Solid Bricks

Image 11 GS Wing - Solid Bricks

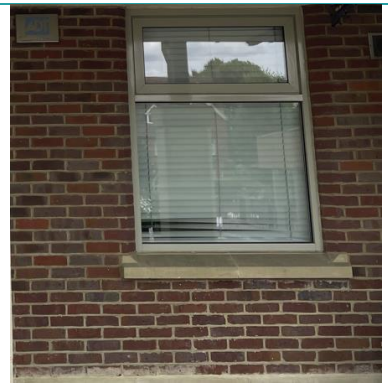


Image 12 GS Wing - Solid Bricks

Image 13 External Areas - Standard 1/2 Brick

Mixed Metals

8.7 Please see Table 4 for the location, type and quantities of the mixed metals found on-Site. Image 14 - Image 28 shows some of the mixed metals found on-Site.

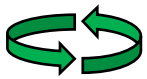
Table 4 Location and Quantities of Mixed Metals

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Fives Courts	Metal Vent Grills	0.01	0.09
	Steel Radiators	0.11	0.02
GS Wing	Metal Window Frames	0.49	3.76
	Metal Skylight Frames	1.11	8.43
	Metal Railings	0.02	0.12
	Steel Mesh Fencing	0.04	0.10
	Leadwork	0.04	0.46
	Canopy Steel Column	0.59	4.47
	Canopy Steel Cantilever Beams	0.44	3.36
	Aco Channel	0.02	0.06
	Internal Railings	0.02	0.12
	Steel Radiators	0.240	1.824
External Areas	Steel from Lighting Columns	0.02	0.06
	Basketball Steel	0.004	0.01
	Chain-link Mesh Fencing	5.28	14.26
	Metal Railing	0.56	1.50
	Steel Bridge Walkway	0.17	0.45
	Metal Key Clamp Railing	0.29	0.78
Total		**9.454**	**39.874**

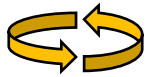
General Observation

8.8 There are metal cast railings on the walkway at roof level. These were found in fair condition with some spans showing isolated areas of surface corrosion. Steel mesh fencing was found around the perimeter of tennis courts and was found in good condition throughout. Aluminium Windows and doors were found to be in fair condition in most areas however, the external door and windows at the rear of QS wing were noted to be in poor condition.

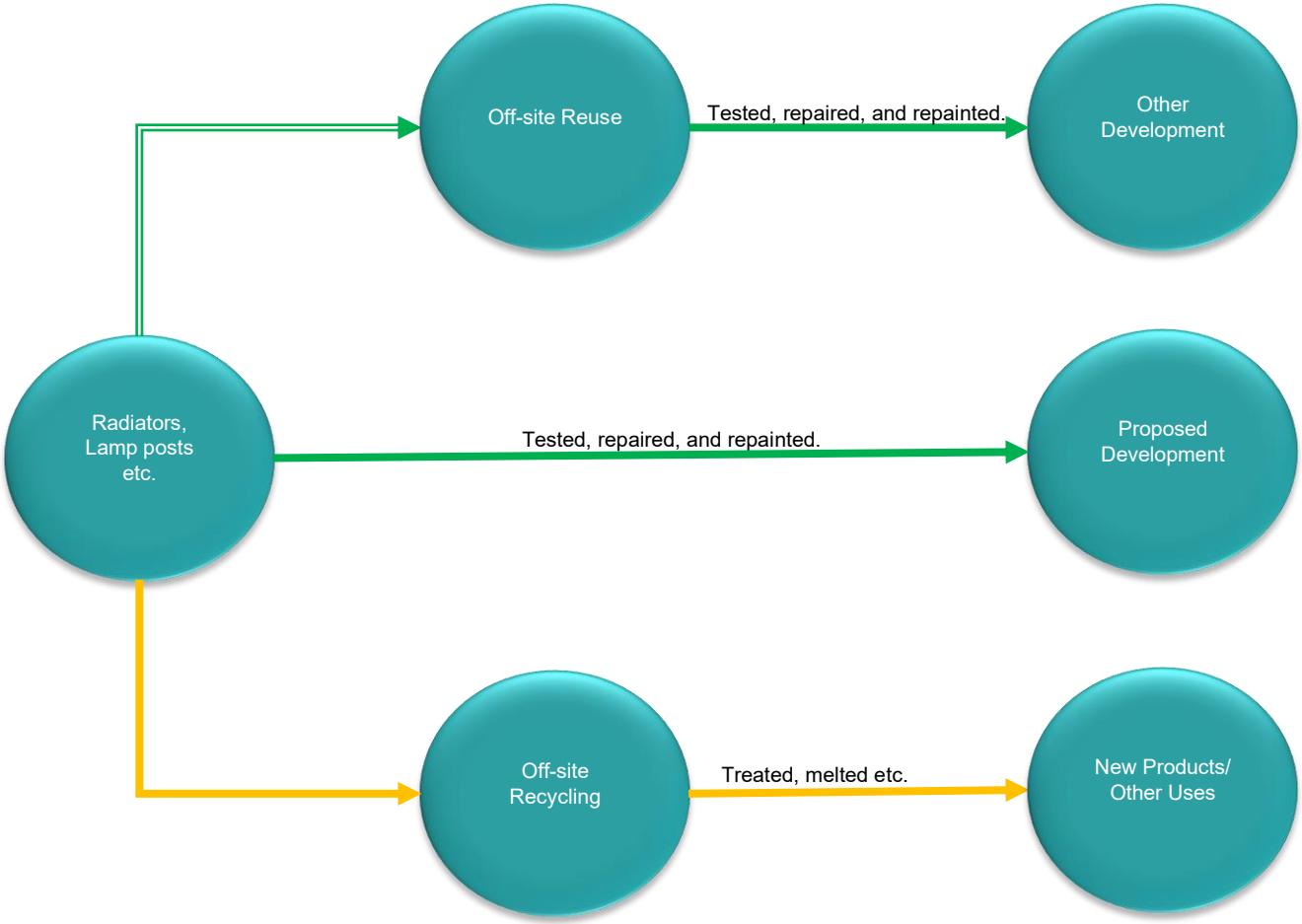
General Recommendation and Limitations



Based on further testing (including compliance with proposed heating systems), the steel plated radiators can be cleaned and reused on or off-site. The lamp posts (after replacement of non-working electricals and subject to testing) can be repainted and reused on or off-site.



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


Off-site Reuse
Tested, repaired, and repainted.
Other Development
Radiators, Lamp posts etc.
Tested, repaired, and repainted.
Proposed Development
Off-site Recycling
Treated, melted etc.
New Products/ Other Uses

Images

Image 14 Fives Courts - Metal Vent Grills

Image 15 Fives Courts - Steel Radiators

Image 16 GS Wing - Metal Door/Window Frame

Image 17 GS Wing - Metal Skylight Frame

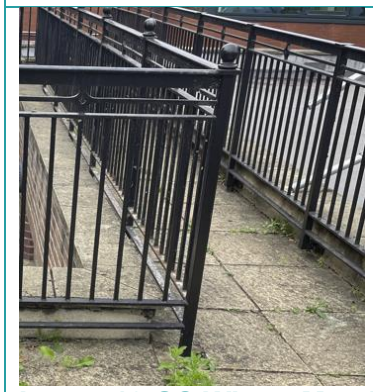


Image 18 GS Wing - Metal Railings

Image 19 GS Wing - Steel Mesh Fencing

Image 20 GS Wing - Leadwork

Image 21 GS Wing - Canopy Steel Columns and Cantilever Beams

Image 22 GS Wing - Aco Channel

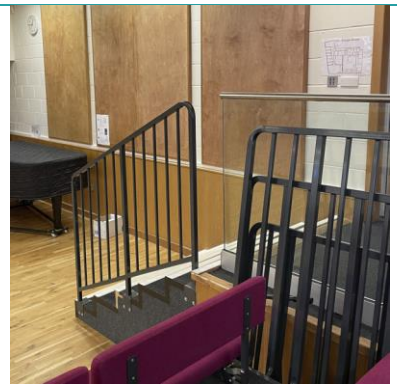


Image 23 GS Wing - Internal Railings

Image 24 External Areas - Steel from Lighting Column

Image 25 External Areas - Chain-link Mesh Fencing

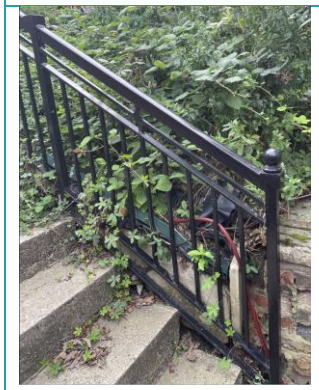


Image 26 External Areas - Metal Railings

Image 27 External Areas - Steel Bridge Walkway

Image 28 External Areas - Metal Key Clamp Railing

Timber and Timber Products

8.9 Please see Table 5 for the location, types, and quantities of the timber and timber products found on-Site. Image 29 - Image 43 shows some of the timber and timber products found on-Site.

Table 5 Location and Quantities of Timber and Timber Products

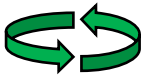
Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (No.)	Approximate Quantity (tonnes)
Fives Courts	Floorboards	0.83		0.58
	Internal Solid Core Door	0.14	2	0.06
	External Timber Door	0.08	1	0.05
	Skirting	0.02		0.01
	Timber from Windows	0.07		0.05
	Timber Beams	0.20		0.12
	Timber from Floor and Roof	8.26		4.96
	Laminate Timber	0.46		0.32
	Timber Panelling	0.44		0.30
	Timber from Stud Wall	0.77		0.54
Maintenance Shed	Floorboards	0.83		0.58
	Timber Gate	0.01		0.01
	Timber slates from Wall	1.02		0.72
	Timber Slates from Ceiling	0.89		0.53
	Timber from Windows	0.27		0.19
	Timber Roof Truss	0.24		0.14
	Timber Batons	0.03		0.02
	Timber Privacy Screen	0.15		0.09
GS Wing External Areas	Floorboards	4.71		3.30
	Internal Hollow Core Door	1.45	23	0.30
	Skirting	0.26		0.18
	Timber from Floors and Roof	0.70		0.42
	Laminate Timber	2.62		1.83

	Cabinet Double Base Unit	0.02		0.09
	Cabinet Single Base Unit	0.01		0.04
	Timber Wall Sound Insulation	0.23		0.43
	Timber Roof – Plant Room	0.28		0.20
External Areas	Timber Border	0.28		0.20
Total		**25.27**	**26**	**16.26**

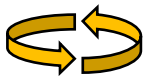
General Observation

8.10 The timber cladding slats in Fives Courts were noted to be in fair condition with only minor signs of weathering. The timber framed windows in Fives Courts and Maintenance shed were end of life and in poor condition. Wooden flooring was found in the GS Wing showed some signs of wear and tear from footfall.

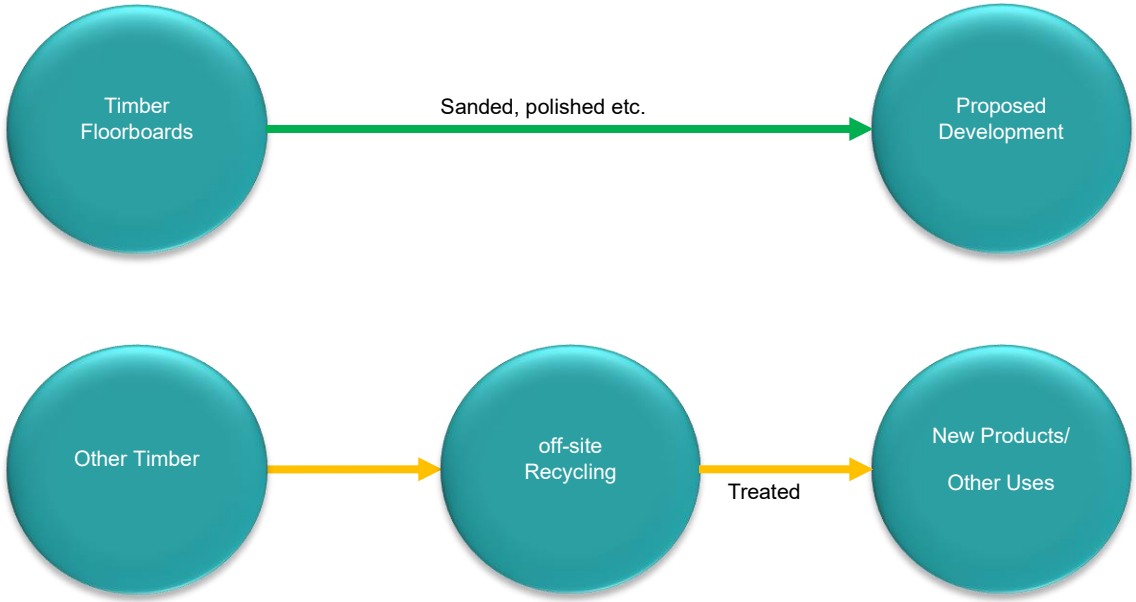
General Recommendation and Limitations



Timber floorboards can be sanded and be potentially reused in the Proposed Development.



Although, other timber items such kitchen units, timber doors can be reused, however, due to varying quality of these items and the requirement of additional testing (to confirm the reuse of structural and non-structural timber), these items will be sent for off-site recycling.


Timber Floorboards
Sanded, polished etc.
Proposed Development
Other Timber
off-site Recycling
Treated
New Products/ Other Uses

Images

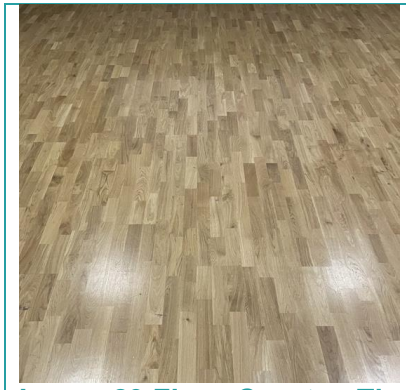


Image 29 Fives Courts - Timber Floorboard

Image 30 Fives Courts - Timber Skirting

Image 31 Fives Courts - Timber from Windows

Image 32 Fives Courts - Timber Panelling

Image 33 Maintenance Shed - Timber Gate

Image 34 Maintenance Shed - Timber Slates from Ceiling

Image 35 Maintenance Shed - Timber Roof Truss

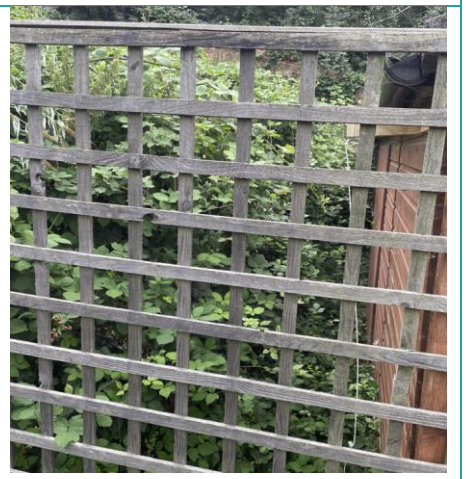


Image 36 Maintenance Shed - Timber Privacy Screen

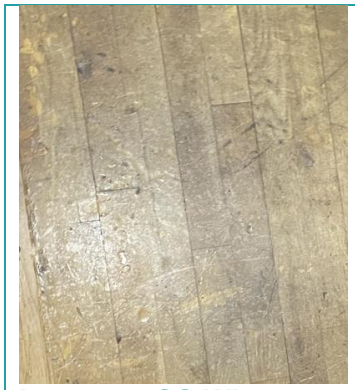


Image 37 GS Wing - Floorboards

Image 38 GS Wing - Internal Hollow Core Door

Image 39 GS Wing - Skirting

Image 40 GS Wing - Laminate Timber

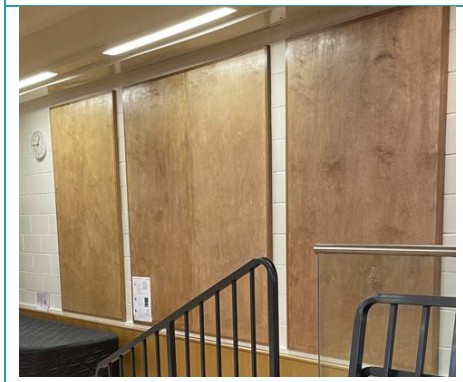


Image 41 GS Wing - Timber Wall Sound Insulation

Image 42 GS Wing - Timber Roof Plant Room

Image 43 External Areas - Timber Border

Tiles and Ceramics

8.11 Please see Table 6 for the location, types, and quantities of the tiles and ceramics found on-Site. Image 44 - Image 46 shows the tiles and ceramics found on-Site.

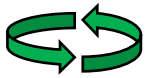
Table 6 Location and Quantities of Tiles and Ceramics

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Fives Courts	Grid Mineral Ceiling Tiles	1.10	0.17
	Stramit Board Tiles	2.66	0.04
	Ceramic Wall Sign	0.001	0.003
GS Wing	Standard Ceramic Floor/Wall Tiles	0.19	0.33
	Quarry Tiles	3.38	6.08
Total		**7.331**	**6.623**

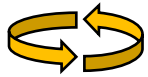
General Observation

8.12 The tiles and ceramics found on-site was noted to be in varying quality i.e., from reasonable to poor.

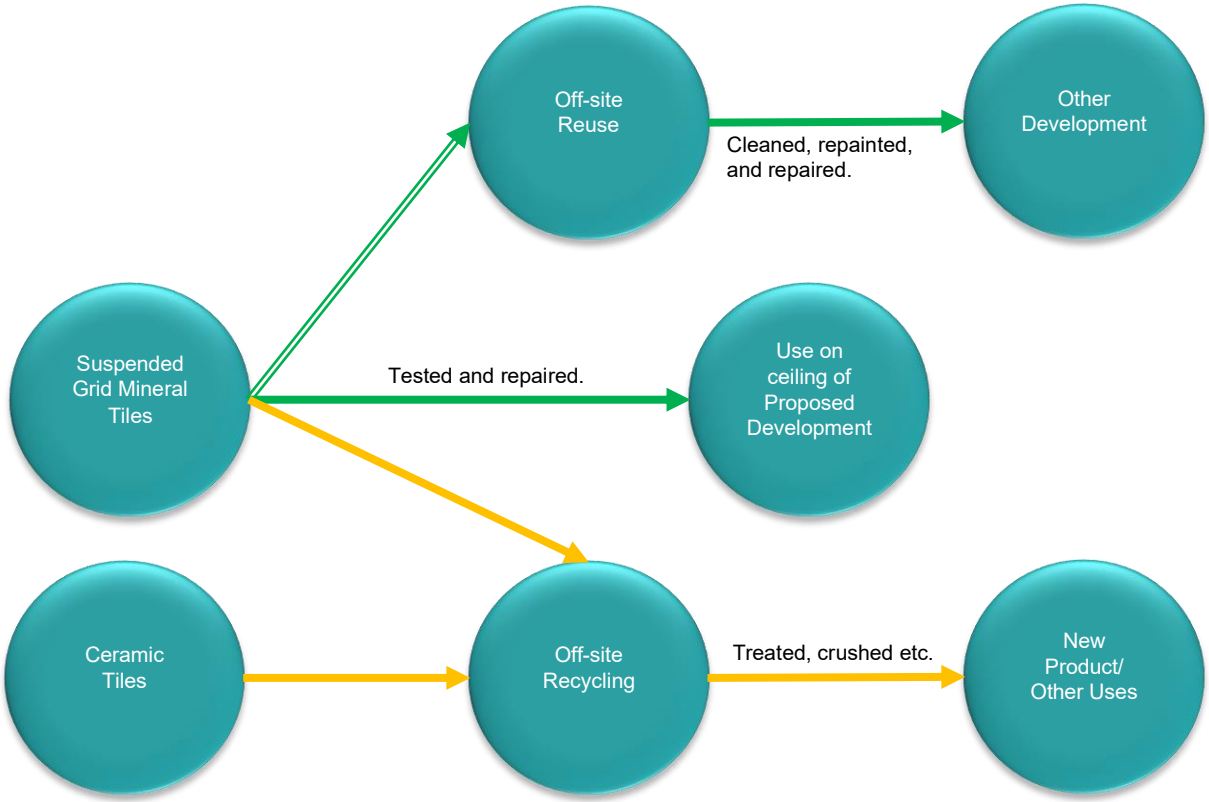
General Recommendation and Limitations



Depending on the design and subject to testing, the suspended grid mineral tiles can be reused on and off-site.



Due to the binding applied to the standard wall ceramic tiles, these ceramic tiles will be sent off-site for recycling. In case, the suspended grid mineral tiles do not meet the requirements of the Proposed Development, then these can be sent off-site for recycling.


Off-site Reuse
Other Development
Cleaned, repainted, and repaired.
Suspended Grid Mineral Tiles
Tested and repaired.
Use on ceiling of Proposed Development
Ceramic Tiles
Off-site Recycling
Treated, crushed etc.
New Product/ Other Uses

Images

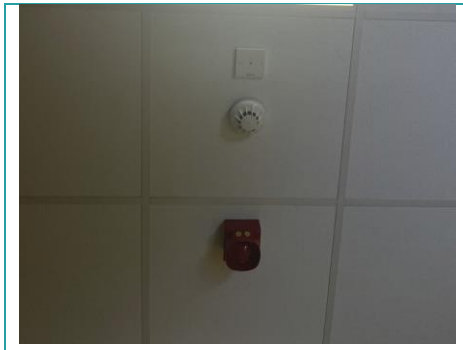


Image 44 Fives Courts - Grid Mineral Ceiling Tiles

Image 45 GS Wing - Standard Ceramic Floor/Wall Tiles

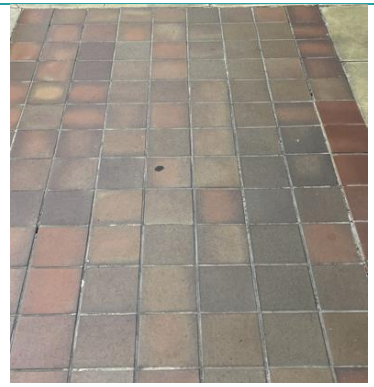


Image 46 GS Wing - Quarry Tiles

Gypsum based construction material (including plasterboard)

8.13 Please see Table 7 for the location, types, and quantities of the gypsum based construction material (including plasterboard) found on-site. Image 47 - Image 48 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)

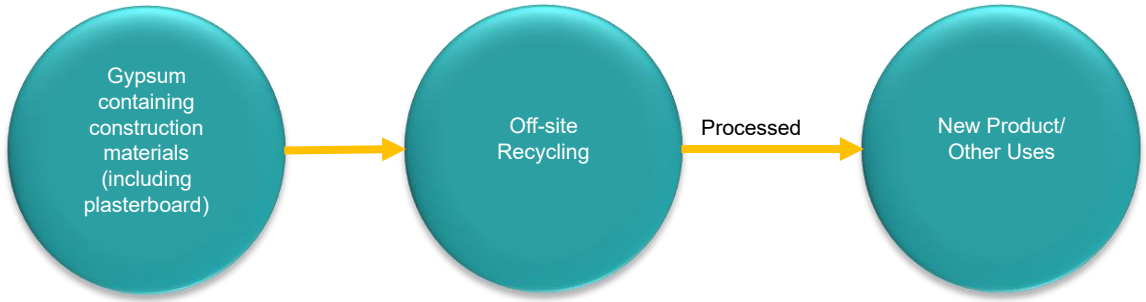
Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Fives Courts	Plasterboard Walls	4.93	2.96
	Plasterboard Ceiling	0.36	0.22
GS Wing	Plasterboard Walls	1.22	0.73
Total		**6.51**	**3.91**

General Observation

8.14 The plasterboard in the Fives Courts was in poor condition. The plasterboard in GS wing was noted to be in good condition.

General Recommendation and Limitations

All plasterboard will be sent off-site for recycling.



Images

Image 47 Fives Courts - Plasterboard Wall

Image 48 GS Wing - Plasterboard Wall

Glass

8.15 Please see Table 8 for the location, types, and quantities of the glass found on-Site. Image 49 - Image 55 shows some of the glass found on-Site.

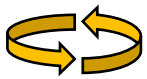
Table 8 Location and Quantities of Glass

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Fives Courts	Single Glazed Window	0.01	0.02
	Wall Mirror	0.08	0.20
Maintenance Shed	Single Glazed Window	0.03	0.08
GS Wing	Single Glazed Window	0.10	0.25
	Glass from Name Plates	0.03	0.07
	Double Glazed Window	0.16	0.39
	Glass from Internal Doors	0.004	0.01
	Glass from Railings	0.03	0.08
Total		**0.444**	**1.10**

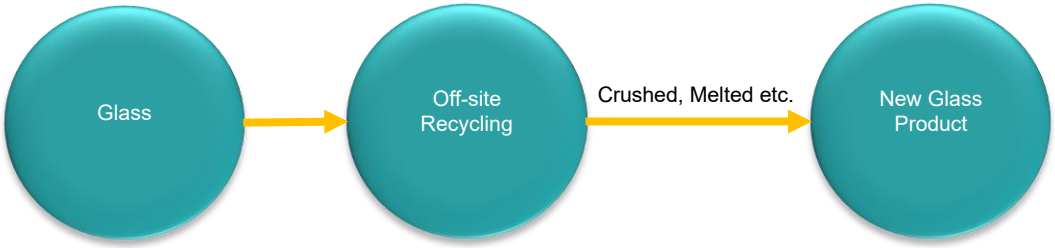
General Observation

8.16 Glass found on-site was noted to be in reasonable 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 49 Fives Courts - Single Glazed Window

Image 50 Fives Court - Wall Mirror

Image 51 Maintenance Shed - Single Glazed Window

Image 52 GS Wing - Single Glazed Window

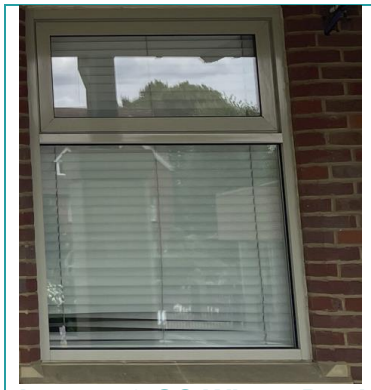


Image 53 GS Wing - Double Glazed Window

Image 54 GS Wing - Glass from Internal Doors

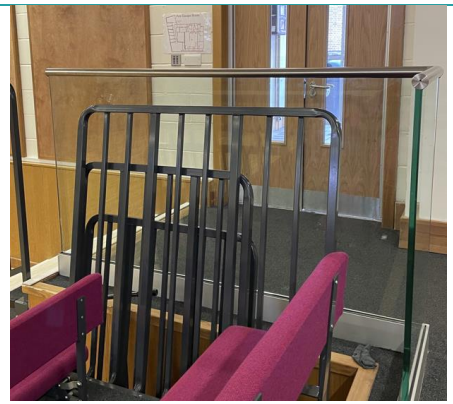


Image 55 GS Wing - Glass from Railings

Textiles

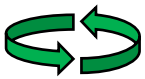
8.17 Please see Table 9 for the location, types, and quantities of the textiles found on-Site. Image 56 - Image 58 shows some of the textiles found on-site.

Table 9 Location and Quantities of Textiles

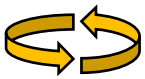
Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
GS Wing	Carpet	2.19	1.87
Total		**2.19**	**1.87**

General Observation

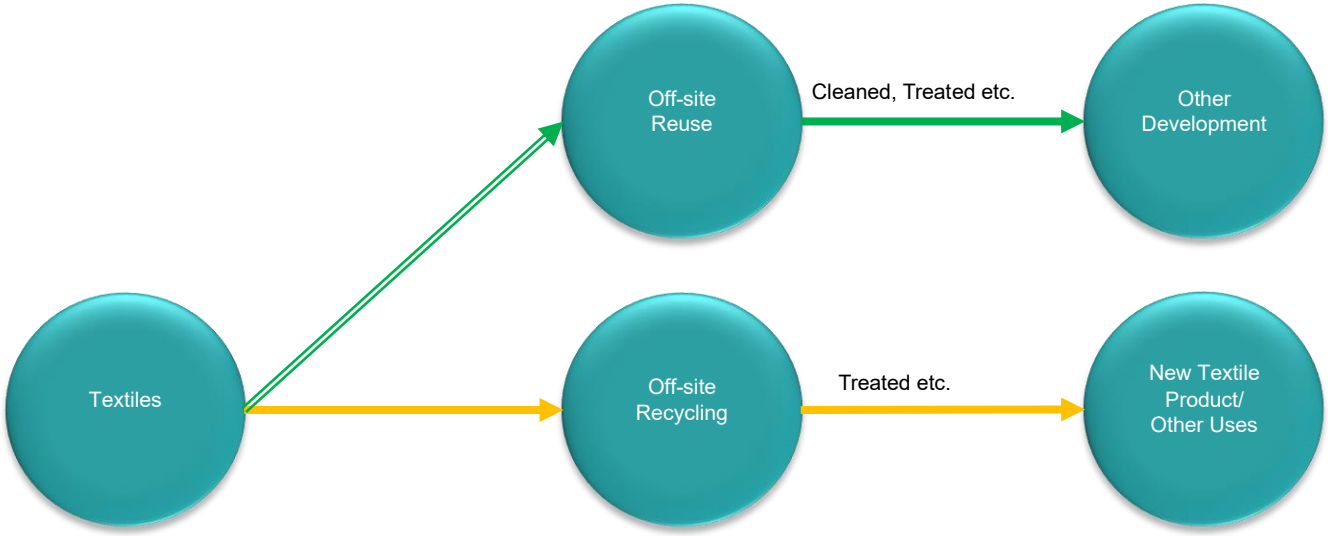
8.18 Most rooms in GS Wing were finished in carpet and were noted to be in good to fair condition throughout with no obvious signs of wear and tear. General Recommendation and Limitations



The carpet can be cleaned, treated, and sent off-site for reuse.



Alternatively, these can be sent off-site for recycling.


Off-site
Reuse
Cleaned, Treated etc.
Other
Development
Textiles
Off-site
Recycling
Treated etc.
New Textile
Product/
Other Uses

Images

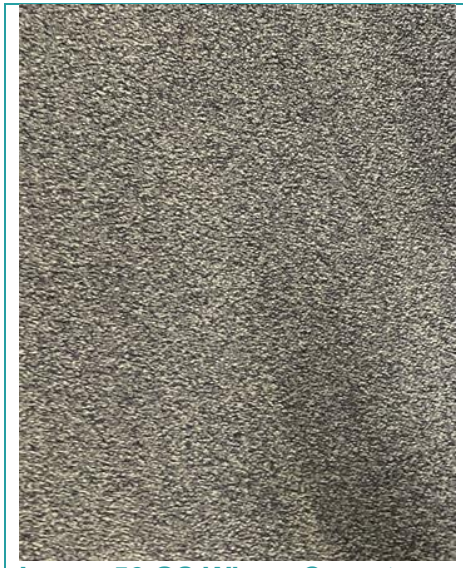


Image 56 GS Wing - Carpet

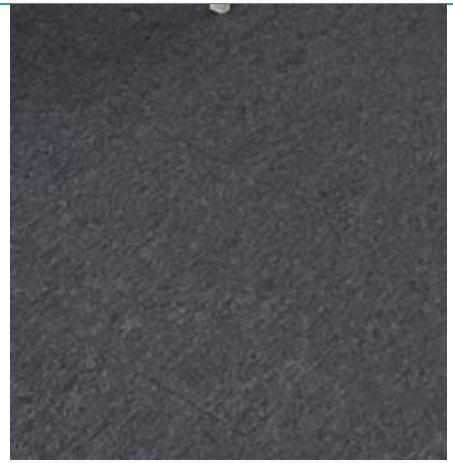


Image 57 GS Wing - Carpet

Image 58 GS Wing - Carpet

Plastics

8.19 Please see Table 10 for the location, types, and quantities of the plastics found on-Site. Image 59 - Image 61 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)
GS Wing	Plastic Blinds	0.10	0.10
External Areas	Astroturf	260.93	260.93
Total		**261.03**	**261.03**

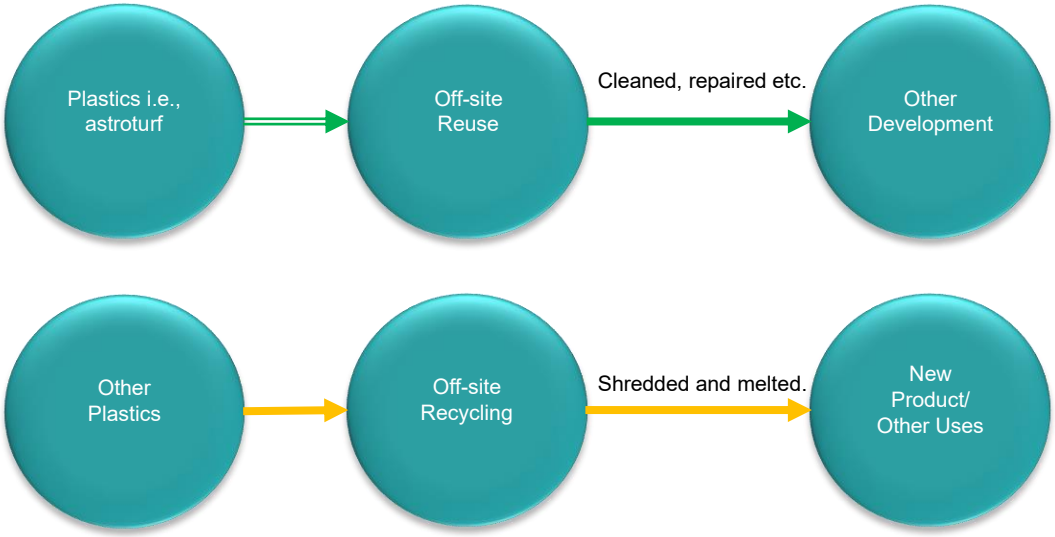
General Observation

8.20 Plastics found on-site were noted to be in fair condition.

General Recommendation and Limitations

The Astroturf can be sent off-site for reuse.

The other plastics will be sent off-site for recycling.


Plastics i.e., astroturf
Off-site Reuse
Cleaned, repaired etc.
Other Development
Other Plastics
Off-site Recycling
Shredded and melted.
New Product/ Other Uses

Images

Image 59 GS Wing - Plastic Blinds

Image 60 GS Wing - Plastic Blinds

Image 61 External Areas - Astroturf

Bituminous Mixtures (including asphalt, tarmac etc.)

8.21 Please see Table 11 for the location, types, and quantities of the bituminous mixtures (including asphalt, tarmac etc.) found on-site. Image 62 shows some of the bituminous mixtures (including asphalt, tarmac etc.) found on-site.

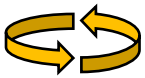
Table 11 Location and Quantities of Stone

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
External Areas	Tarmacadam	7.29	15.31
Total		**7.29**	**15.31**

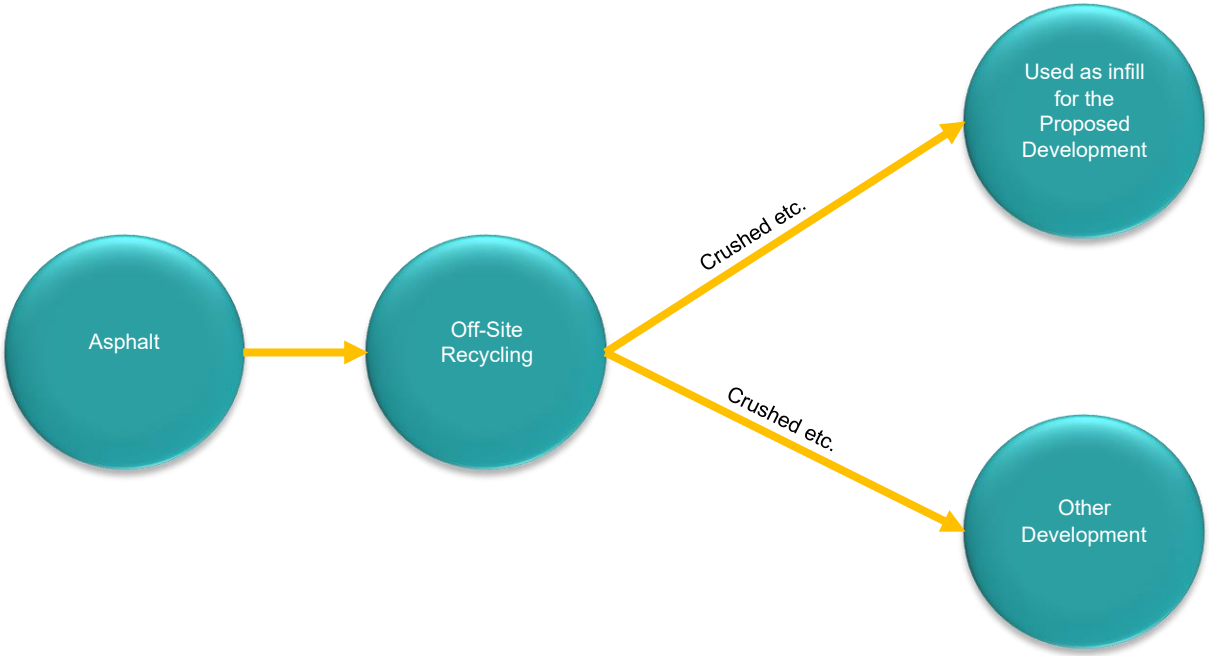
General Observation

8.22 The bituminous mixtures (including asphalt, tarmac etc.) found on-site were noted to be in fair quality.

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 in-fill material or used in the Proposed Development or another development.



Images

Image 62 External Areas - Tarmacadam

Stone

8.23 Please see Table 12 for the location, types and quantities of the stone found on-site. Image 63 shows some of the stone found on-site.

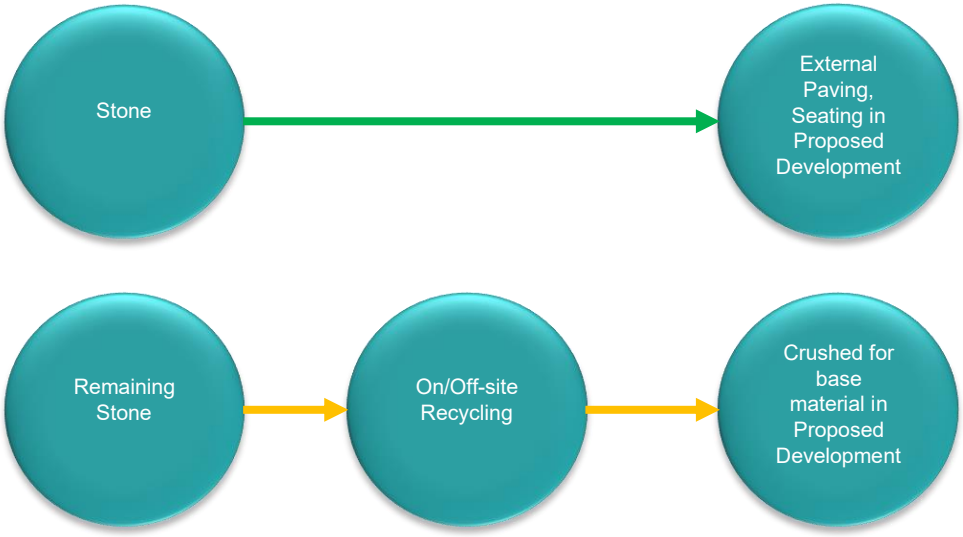
Table 12 Location and Quantities of Stone

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
GS Wing	Stone Cladding and Slabs	4.32	6.48
Total		**4.32**	**6.48**

General Recommendation and Limitations

Stone can be reused for external paving, seats etc.

All remaining stone will be sent off-site for recycling.



Images

Image 63 GS Wing - Stone Cladding

Rubber

8.24 Please see Table 13 for the location, types and quantities of the rubber found on-site. Image 64 shows some of the rubber found on-site.

Table 13 Location and Quantities of Rubber

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
GS Wing	EPDM Roofing	0.37	0.34
Total		**0.37**	**0.34**

General Recommendation and Limitations

All rubber will be sent off-site for recycling.

Images

Image 64 GS Wing - EPDM Roofing

Bituminous Mixtures (including Mineral Roof Felt)

8.25 Please see Table 14 for the location, types and quantities of the bituminous mixtures (including mineral roof felt) found on-site. Image 65 - Image 66 shows some of the bituminous mixtures (including mineral roof felt) found on-site.

Table 14 Location and Quantities of Bituminous Mixtures (including Mineral Roof Felt)

Area/Location	Type	Approximate Quantity (m^3)	Approximate Quantity (tonnes)
Fives Courts	Mineral Roof Felt	0.73	0.33
Maintenance Shed	Mineral Roof Felt	0.73	0.33
Total		**1.46**	**0.66**

General Recommendation and Limitations

All bituminous mixtures (including mineral roof felt) will be sent off-site for recycling.

Images

Image 65 Fives Courts - Mineral Roof Felt

Image 66 Maintenance Shed - Mineral Roof Felt

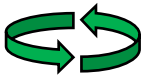
Luminaries

8.26 Please see Table 15 for the location, types and quantities of the luminaries found on-site. Image 67 - Image 71 shows some of the luminaries found on-site.

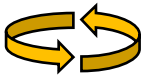
Table 15 Location and Quantities of Luminaries

Area/Location	Type	Approximate Quantity (No.)
Fives Courts	Fluorescent Tubes	6
	Incandescent Bulbs	11
Maintenance Shed	Fluorescent Tubes	6
GS Wing	Fluorescent Tubes	78
	Light Emitting Diode (LED)	44
External Areas	LED	10
Total		**155**

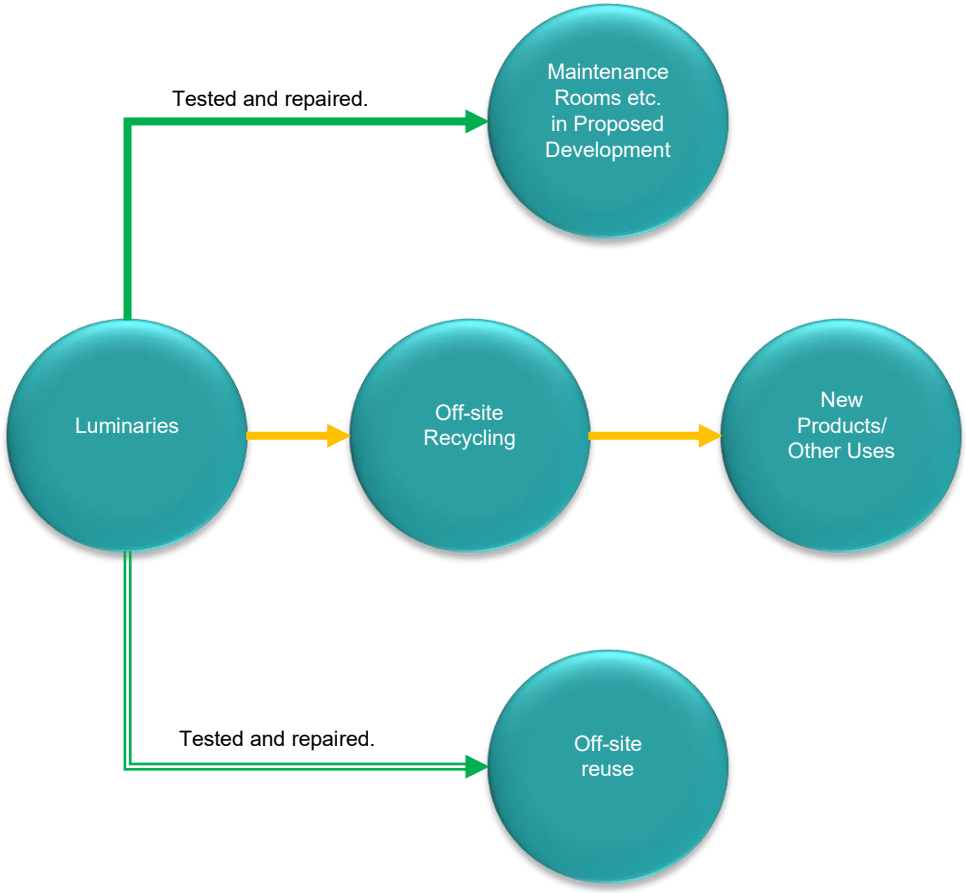
General Recommendation and Limitations



Subject to testing, some luminaries can be used in the Proposed Development for maintenance rooms 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.


Tested and repaired.
Maintenance Rooms etc. in Proposed Development
Luminaries
Off-site Recycling
New Products/ Other Uses
Tested and repaired.
Off-site reuse

Images

Image 67 Fivers Courts - Luminaries

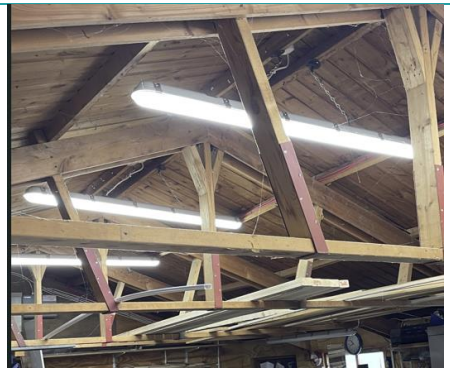


Image 68 Maintenance Shed - Luminaries

Image 69 External Areas - Luminaries

Image 70 GS Wing - Luminaries

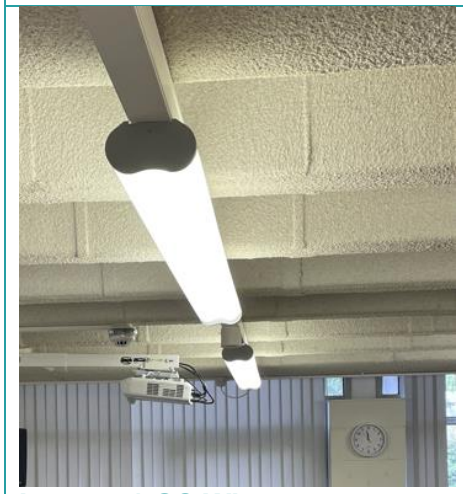


Image 71 GS Wing - Luminaries

9. Estimated Quantities of Materials Identified

9.1 Estimated quantities of the materials anticipated to be generated during the demolition process are provided in Table 16. 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 5 and Figure 6 shows the percentage breakdown of waste identified during the site visit.

9.2 It should be noted that the recovery potential provided within Table 16 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 19 provides the quantities the design team intend to use on-site.

Table 16 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	315.87	42%	711.1	57%	100%	315.87	-	711.1	-	
Bricks	17.01.02	106.23	14%	191.21	15%	100%	106.23	-	191.21	-	
Mixed Metals	17.04.07	9.454	1%	39.874	3%	100%	9.454	-	39.874	-	
Timber and Timber Products	17.02.01	25.27	3%	16.26	1%	95%	24.01	1.26	15.45	0.81	
Tiles and Ceramics	17.01.03	7.331	1%	6.623	1%	100%	7.331	-	6.623	-	
Gypsum based construction materials (including plasterboard)	17.08.02	6.51	1%	3.91	0.3%	95%	6.18	0.33	3.71	0.20	
Glass	17.02.02	0.444	0.1%	1.10	0.1%	100%	0.444	-	1.10	-	
Textiles	20.01.11	2.19	0.3%	1.87	0.1%	100%	2.19	-	1.87	-	
Plastics	17.02.03	261.03	35%	261.03	21%	100%	261.03	-	261.03	-	
Bituminous Mixtures (including asphalt, tarmac etc.)	17.05.04	7.29	1%	15.31	1%	95%	6.93	0.36	14.54	0.77	
Stone	17.05.04	4.32	1%	6.48	1%	100%	4.32	-	6.48	-	
Rubber	04.02.09	0.37	0.05%	0.34	0.03%	100%	0.37	-	0.34	-	
Bituminous Mixtures (including	17.03.02	1.46	0.2%	0.66	0.1%	0%	-	1.46	-	0.66	

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
Mineral Roof Felt)											
Total		**747.769**		**1,255.767**			**744.359**	**3.41**	**1,253.327**	**2.44**	
Numbers may not add up due to rounding.											

Figure 5 Approximate Quantities of Materials (%) by Volume

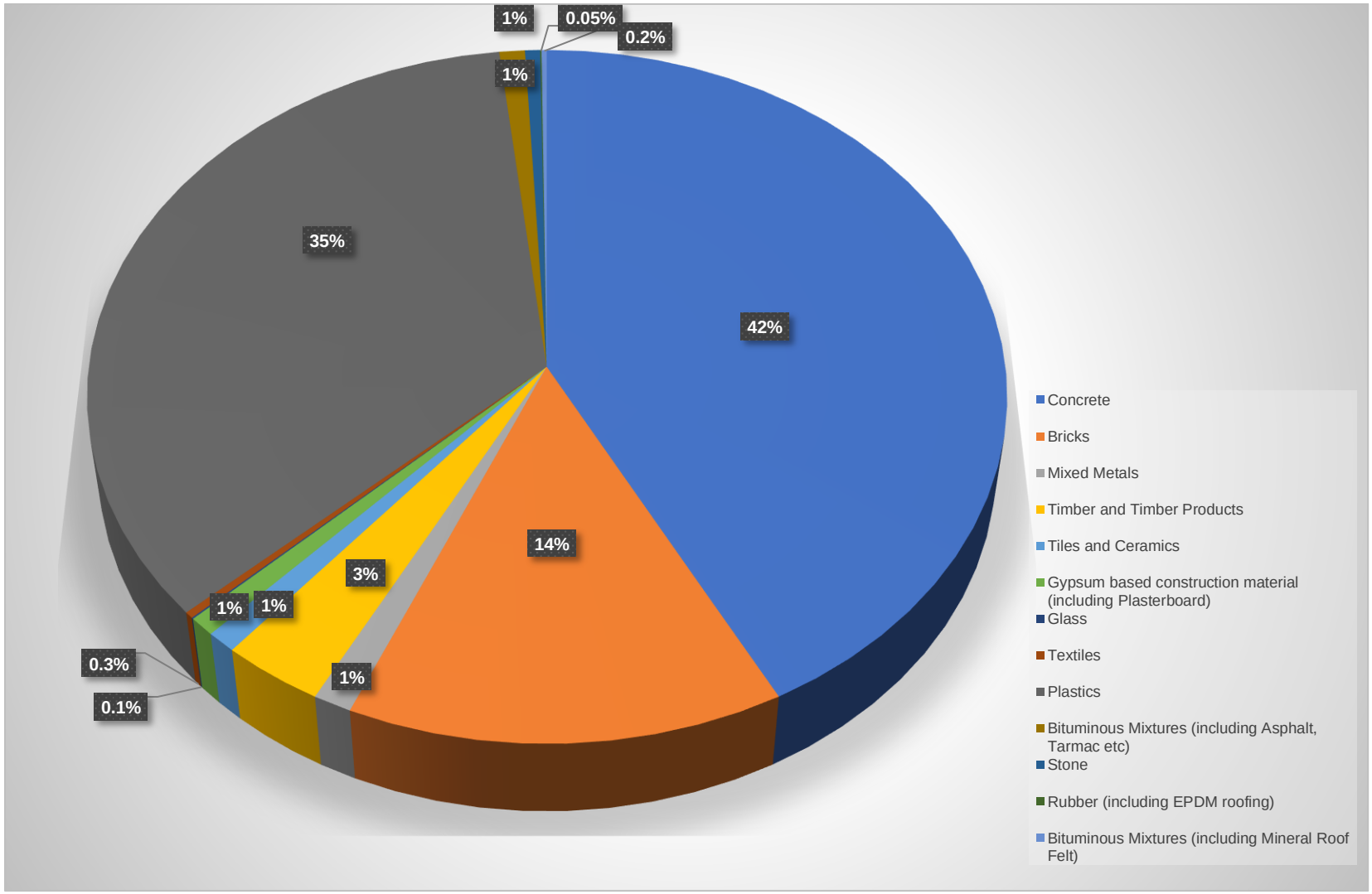
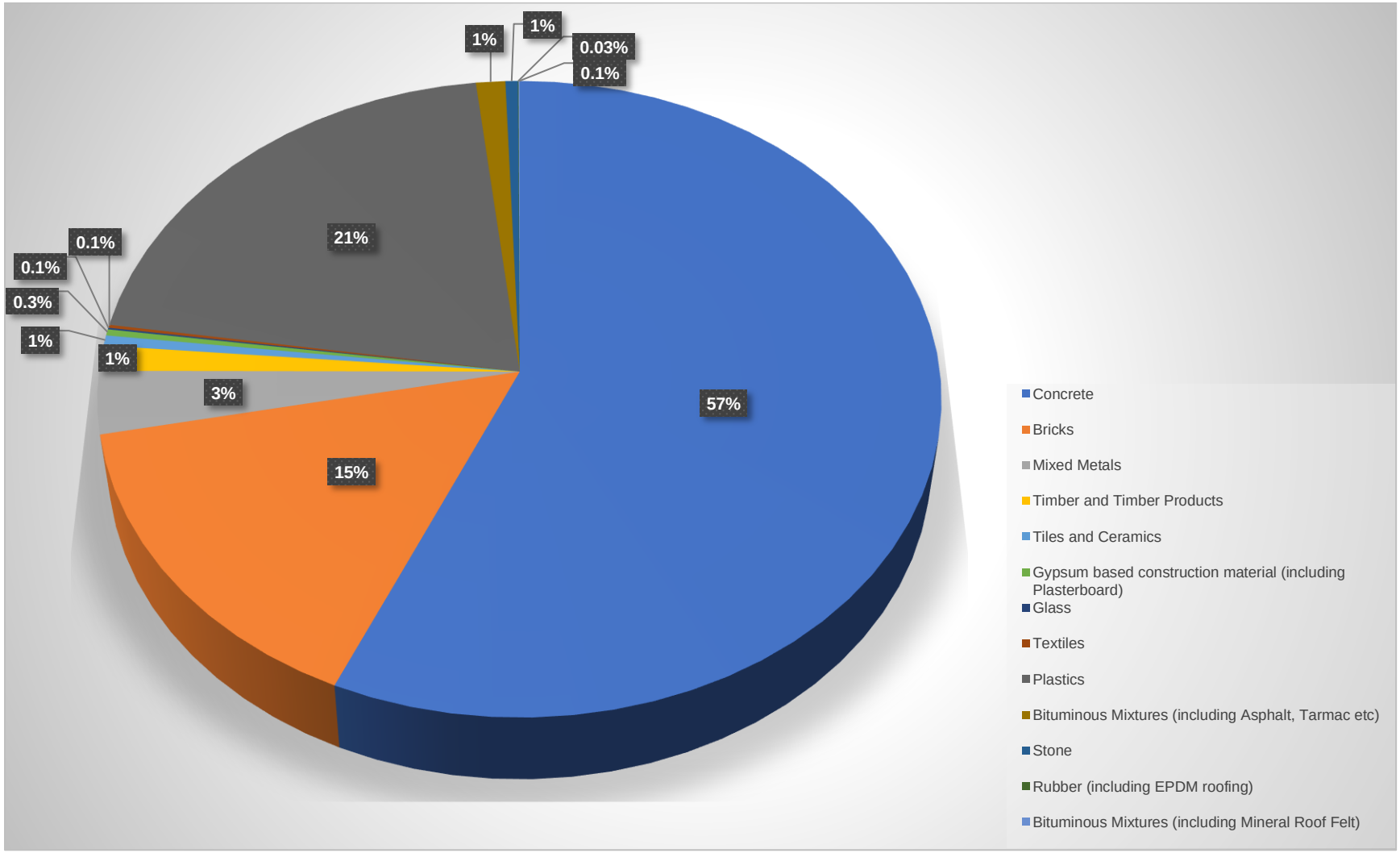


Figure 6 Approximate Quantities of Materials (%) by Tonnage



10. Embodied Carbon

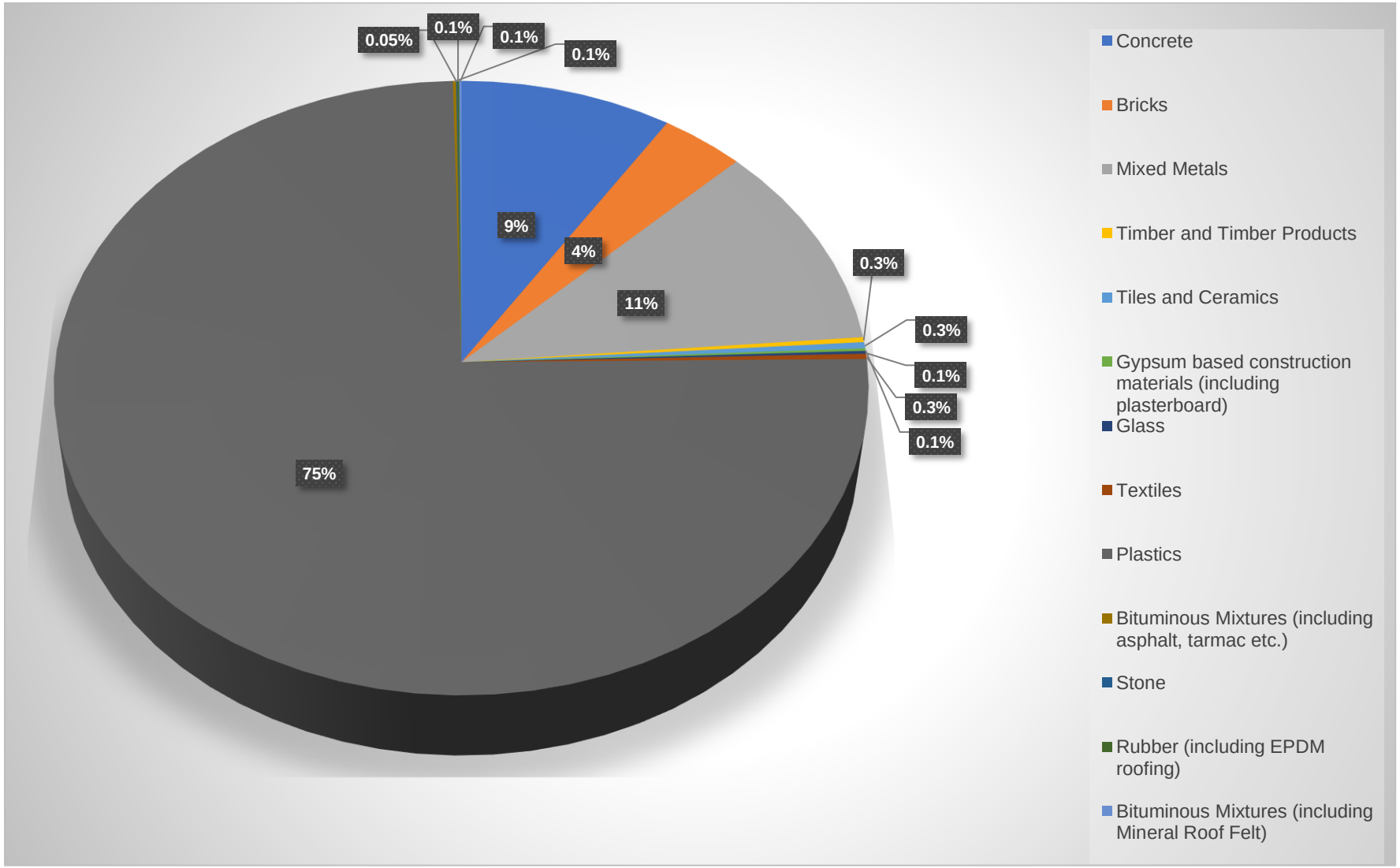
10.1 The approximate quantities of embodied carbon from the demolition materials have been estimated using Inventory of Carbon and Energy (ICE) database version 3. It should be noted that as the survey undertaken was non-intrusive, therefore, classification and identification of materials have been based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

10.2 Table 17 provides the potential quantities of embodied carbon (tCO_2e), which are further represented in Figure 7.

Table 17 Approximate Quantities of Embodied Carbon (tCO_2e)

Material	Approximate Quantity (t)	tCO_2e
Concrete	711.1	101.57
Bricks	191.21	40.15
Mixed Metals	39.874	121.98
Timber and Timber Products	16.26	2.89
Tiles and Ceramics	6.623	3.62
Gypsum based construction materials (including plasterboard)	3.91	1.52
Glass	1.10	1.66
Textiles	1.87	3.06
Plastics	261.03	832.67
Bituminous Mixtures (including asphalt, tarmac etc.)	15.31	1.52
Stone	6.48	0.51
Rubber (including EPDM roofing)	0.34	0.96
Bituminous Mixtures (including Mineral Roof Felt)	0.66	1.09

Figure 7 Approximate Quantities of Embodied Carbon (tCO_2e)



11. Waste Reduction Opportunities

11.1 Several workshops were held with the design team (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

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

- Reuse and Recycle on-site -approximately 58%
- Diversion from Landfill – at least 98%

11.3 The key provided in Table 18 has been adopted to show the opportunity of each material identified.

Table 18 Opportunity Key

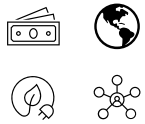
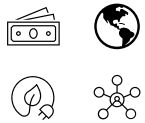
Key	Description
	Reduction in landfill costs
	Reduced environmental impact
	Less carbon/energy intensive
	Preserve natural resources
	Corporate social responsibility

11.4 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 19.

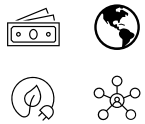
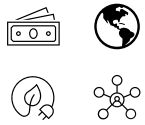
11.5 There are several opportunities to apply the waste hierarchy and Circular Economy to the buildings being demolished and examples of local reprocessing and recycling facilities have been identified, where appropriate, in this Report. However, these facilities suggested in Table 19 are not an exhaustive 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:

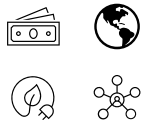
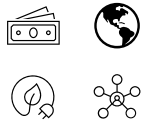
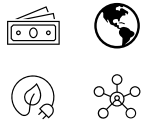
- Reducing costs associated with disposal,
- Realising financial benefits by diverting waste from landfill, and
- Environmental and social benefits of implementing the waste hierarchy and Circular Economy.

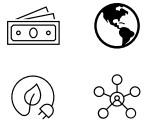
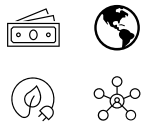
Table 19 Waste Reduction Opportunities

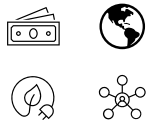
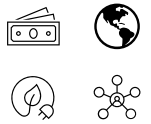
Material	Circularity Rating	Suggestion: on-Site Reuse	Suggestion: on-Site Recycle	Suggestion: off-Site Reuse	Suggestion: off-Site Recycle	Suggestion: Disposal	Opportunity including cost saving due to diversion from landfill[3]	Constraints	Local Reprocessors
Concrete		Due to the design of the Proposed 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 external bases.	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 to save approximately £2,311 on landfilling cost.	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 6% of this material will be re-used on-site for façade and perimeter wall.	It is understood that the remaining of this material i.e., 94% will be crushed and used for external bases.	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 to save approximately £622 on landfilling cost.	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

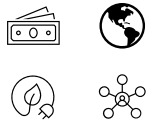
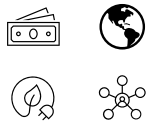
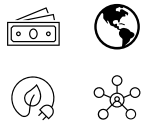
[3] The landfilling cost for this type of waste is based on lower rates i.e., for inert waste @£3.25 per tonne. Please note that this does not include any fee for collection or management. These numbers are for reference only.

									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.	Due to the design of the Proposed Development and the quality of this material, 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 the remaining of this material will be recycled off-site.	This material will not be sent for disposal	 Potential to save approximately £130 on landfilling cost.	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 26% of this material will be re-used on-site.	Due to the design of the Proposed Development and the quality of this material, it is understood that 0% of this material will be recycled on-site.	It is understood that 14% of this material will be re-used off-site.	It is understood that 55% of this material will be recycled off-site.	Approximately 5% of this material will be sent to energy recovery.	 Potential to save approximately £50 on landfilling cost.	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.	Due to the design of the Proposed Development and the quality of this material, 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% material will be recycled off-site.	This material will not be sent for disposal	 Potential to save approximately £22 on landfilling cost.	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.	Due to the design of the Proposed Development and the quality of this material, 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 to save approximately £12 on landfilling cost.	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.	Due to the design of the Proposed Development and the quality of this material, 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 to save approximately £ 4 on landfilling cost.	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.	Due to the design of the Proposed Development and the quality of this material, 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 to save approximately £6 on landfilling cost.	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.	Due to the design of the Proposed Development and the quality of this material, it is understood that 0%	It is understood that 99% of this material (i.e., astroturf) will be re-used off-site.	It is understood that 1% of this material will be	This material will not be sent for disposal		Temporary storage required prior to sending this off-Site.	Yes Waste Construction Waste Tower Hamlets | Licensed & Efficient | Yes Waste

			of this material will be recycled on-site.		recycled off-site.		Potential to save approximately £848 on landfilling cost.		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.	Due to the design of the Proposed Development and the quality of this material, 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 to save approximately £116 on landfilling cost.	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
Stone		Due to the design of the Proposed Development and the quality of this material, it is understood that 46% of this material will be re-used on-site.	Due to the design of the Proposed Development and the quality of this material, it is understood that 54% 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 to save approximately £21 on landfilling cost.	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)
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.	Due to the design of the Proposed Development and the quality of this material, 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 to save approximately £1 on landfilling cost.	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
Bituminous Mixtures (including Mineral Roof Felt)		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.	Due to the design of the Proposed Development and the quality of this material, 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.	100% of this material will be sent off-Site for energy recovery.		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
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.	Due to the design of the Proposed Development and the quality of this material, it is understood that 0%	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

			of this material will be recycled on-site.		recycled off-site.				Enviromate Enviromate | Surplus Material | Community Projects Globe Chain Globechain | Reuse Marketplace for Business

11.6 Waste contractors in the area that collect multiple construction streams (segregated) are shown in Table 20. 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 20 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/

11.7 In addition to the suggestions made above, subject to a feasibility assessment on the space requirements, operational requirements etc, a library of things can also be set-up within the Proposed Development i.e., a space where residents/local businesses can take or buy salvaged materials.

12. General Guidelines for Management of Demolition Materials and Waste

12.1 This pre-demolition 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).

12.2 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 Architects 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.

12.3 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.

13. Recommendations and Next Steps

13.1 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.

13.2 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.

14. Further Information

14.1 In addition to the resources detailed in Table 20, 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