



Pre-Demolition and Pre-Redevelopment Audit Report

Dyne House and Island Site

Client: Highgate School

Prepared: October 2022

Document Control

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Prepared for

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Table of Contents

1. Introduction.....	1
2. Site Information	2
Existing Site	2
Existing Site Analysis.....	5
3. Proposed Works	7
4. Aims and Objectives	10
5. Key Principles.....	10
The Waste Hierarchy	10
The Circular Economy	11
6. Methodology	12
7. Key Waste/Materials Identified.....	13
Concrete	14
Bricks.....	15
Suspended Grid Mineral Tiles	16
Metals	17
Timber and Timber Products.....	18
Tiles and Ceramics	19
Plasterboard (Other Gypsum containing material).....	20
Glass	21
Textiles	22
Plastics (including Vinyl Sheets)	23
Asphalt (containing bituminous material).....	24
Lighting	25
8. Identified Materials Type and Estimated Quantities	26
9. Waste Management Opportunities.....	30
10. General Guidance for Management of Demolition Materials and Waste	38
11. Recommendations and Next Steps.....	39
12. Further Information	40
13. References	41

Tables

Table 1 Circularity Rating	13
Table 2 Location and Quantities of Concrete	14
Table 3 Location and Quantities of Bricks	15
Table 4 Location and Quantities of Suspended Grid Mineral Tiles	16
Table 5 Location and Quantities of Metals	17
Table 6 Location and Quantities of Timber and Timber Products	18
Table 7 Location and Quantities of Tiles and Ceramics	19
Table 8 Location and Quantities of Plasterboard.....	20
Table 9 Location and Quantities of Glass.....	21
Table 10 Location and Quantities of Textiles	22
Table 11 Location and Quantities of Plastics (including Vinyl Sheets).....	23
Table 12 Location and Quantities of Bituminous material.....	24
Table 13 Location and Quantities of Lighting	25
Table 14 Estimated Quantities of Materials.....	27
Table 15 Opportunities Key	30
Table 16 Waste Reduction Opportunities.....	31
Table 17 Waste Companies in London, which collect multiple Construction, Demolition and Excavation (CD&E) Waste Streams	38

Figures

Figure 1 Areas under consideration in this Report (marked 1 - 7)	3
Figure 2 Dyne House	3
Figure 3 Class Room Building, Gymnasium and Dyne House and Auditorium.....	4
Figure 4 Existing Site Plan	7
Figure 5 Dyne House Level -02 Demolition Plans	8
Figure 6 Dyne House Level -01 Demolition Plan.....	8
Figure 7 Dyne House Level 0 Demolition Plan.....	9
Figure 8 Waste Hierarchy	10
Figure 9 Applying Circular Economy Principles to Building Design	11
Figure 10 Approximate Quantities of Materials (%) by Volume	28
Figure 11 Approximate Quantities of Materials by Weight (tonnage).....	29

1. Introduction

KaNect Limited ('KaNect') has been commissioned by Highgate School ('Client') to prepare this Pre-Demolition and Pre-Redevelopment Audit Report ('Report') in support of the redevelopment of the Dyne House and Island site ('Site') located in London Borough of Haringey (LBH).

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 four parts (for Simple Buildings) 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
- **One Credit** – Construction resource efficiency: preparing a compliant Resource Management Plan (RMP) with the aim of minimising and monitoring waste.
- **Two Credits** – Simple buildings – RMP measurements and Reporting
- **One Credit** – Simple buildings – Diversion from landfill

As per the London Plan Guidance: Circular Economy Statement (Ref. 1), to meet Policy SI7 (B) of the London Plan (Ref. 2) 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.

The extent or details required to complete the Pre-Redevelopment audit is not mentioned by the Greater London Authority (GLA), however, based on KaNect's experience of working on these Audit reports, we have included the information in Section 2, that would be useful in understanding the approach adopted for the redevelopment of the Proposed Development.

2. Site Information

Existing Site

The Dyne House Site comprises of the following buildings/areas:

- Dyne House;
- Gibbon Garden;
- Classroom Building;
- Gymnasium;
- Swimming Pool; and
- Parade Ground.

Whereas the Island Site includes the following buildings/areas:

- Chapel Quad (not included in this Report);
- Science Quad (only the Tunnel Entrance included in this Report); and
- Garner Quad (not included in this Report).

Please note that in addition to the Dyne Site, only the Island Site Tunnel Entrance (that is located in the Science Quad) from the Island Site is being considered within this Report.

Dyne House Site:

Dyne House building currently houses the Music Department and Sixth Form Centre. The teaching accommodation comprises 17 classrooms/ seminar rooms and numerous practice rooms and support facilities. The remainder of the Site comprises the Classroom Building (1904), Gymnasium (1950) and the redundant open air swimming pool (1950). In addition, there are two pupil amenity areas; Gibbon Garden located between Dyne House and the Classroom Building; and the Parade Ground which occupies the whole of the east end of the Site.

Figure 1 provides the areas that are under consideration for this Report. Whereas Figure 2 and Figure 3 provides the images of the buildings on site.

Figure 1 Areas under consideration in this Report (marked 1 - 7)



This figure is not drawn to scale

Figure 2 Dyne House



Figure 3 Class Room Building, Gymnasium and Dyne House and Auditorium



Existing Site Analysis

To establish whether retrofitting would be a suitable option, in comparison to the demolition of the existing buildings (on-Site), several parameters were analysed. These parameters have been outlined in this section, however, for more details please refer to the Dyne House and Island Site Design and Access Statement prepared by Hopkins architects.

Access

- The Auditorium at the rear of Dyne House is in good condition. Access to it is, however, poor and requires improvement within the new scheme.
- The corridors on each floor are relatively long, are uninviting and daylight only comes from a window at one end.
- The tunnel, under Southwood Lane deals unsatisfactorily with the changes of levels.
- The two staircases, north and south, do not provide an inviting way to move vertically within the building.
- The redevelopment of the Island Site (IS) will address the School's responsibilities under the 2010 Equality Act, providing full accessibility and improved circulation between several existing School buildings; relieve the shortage of gender balanced WC provision for pupils, and remove the detrimental overall appearance of the current building to the Conservation Area

Compliance

The building is not fully accessible. The lift although capable of taking a wheelchair is of a shape and size that is not Part M compliant.

Proposed Use

- The ground floor was designed for use as a large entry area/ reception to the building. Security requirements and changes in educational use have resulted in this having become a large indoor pupil amenity space/horizontal circulation area. The space is too small for the former and too wide for the latter giving a totally unsatisfactory dual use.
- Additional and improved space is needed to meet the academic requirements of the Senior School campus and the only way to achieve this is through the sensitive redevelopment of the Dyne House site
- The building gives the character, both internally and externally, of a dated 1960's building and does not provide the inviting, stimulating and uplifting educational experience that is required by the School.

Ceiling Heights

The large proportions of the rooms and high ceilings are not conducive to modern educational requirements.

Insulation

The uninsulated envelope of the building and single pane glazing result in unsatisfactory environmental conditions particularly in winter.

Existing Structure

The main structure of the building is in good condition and investigation has shown it can have a long future life if a full refurbishment and re-cladding of the front and rear takes place to bring it up to modern standards.

Based on the above analysis, it was concluded that the existing Teaching Building, Drama Studio and the redundant swimming pool are removed. Whereas, the Dyne House is stripped back to its frame for refurbishment.

For the Island Site Tunnel Building, part demolition is proposed.

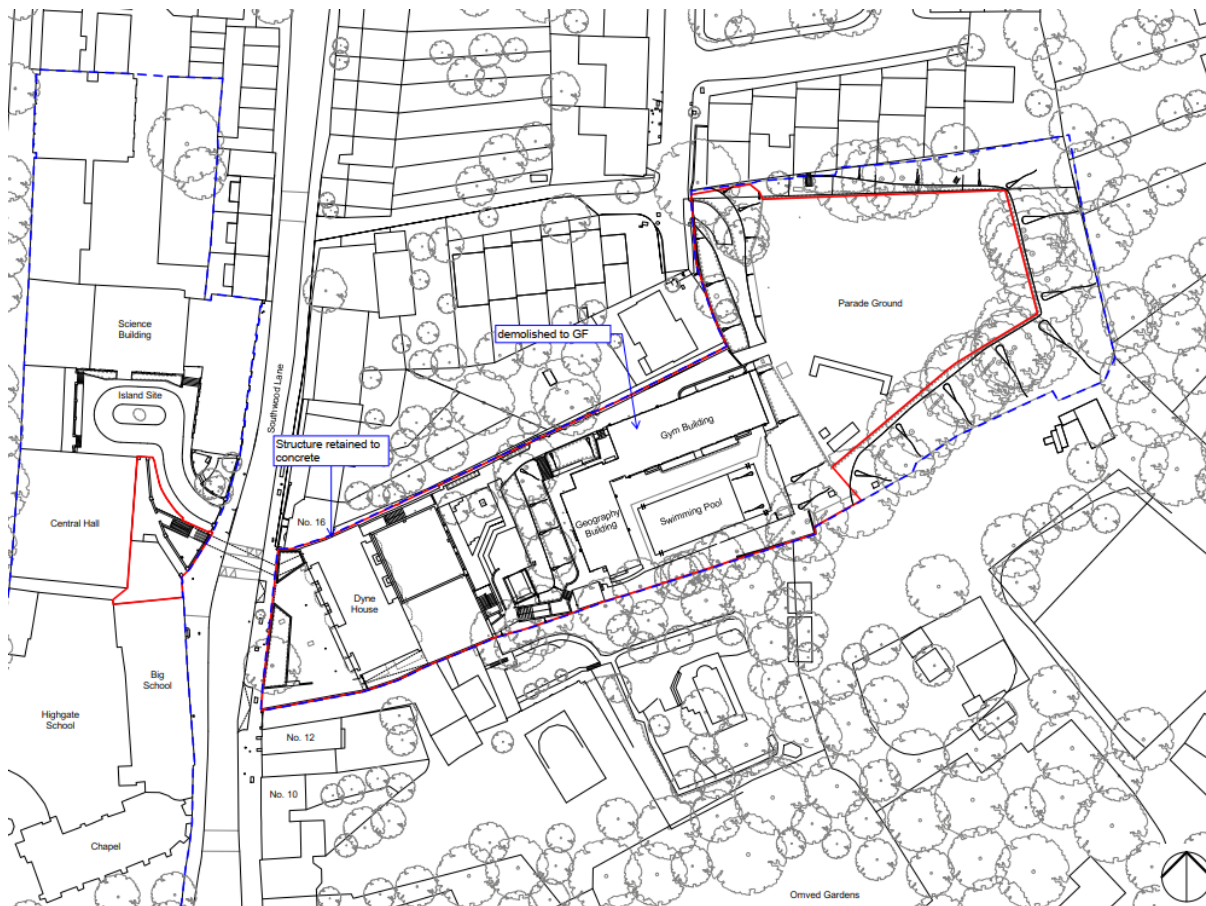
3. Proposed Works

As part of the redevelopment of the Dyne House and Island Site Tunnel Site, the following works will be undertaken including:

- Removal of the existing Teaching Building, the Drama Studio, redundant swimming pool site; Stripping Dyne House back to its concrete frame for refurbishment and reconfiguration;
- Construction of a new front and rear extension to Dyne House; new public realm and surrounding hard and soft landscaping works.
- The proposed Island Site Tunnel Building involves the removal of the west exit stair from the pedestrian tunnel, an external wall with intermediate gateposts, existing WC block & two southernmost gateposts and adjacent railings;
- Construction of a new building to house students, staff & accessible WC; external lift & new stair access; and improved landscaping including new boundary wall & railings.

Figure 4 shows the existing Site plan.

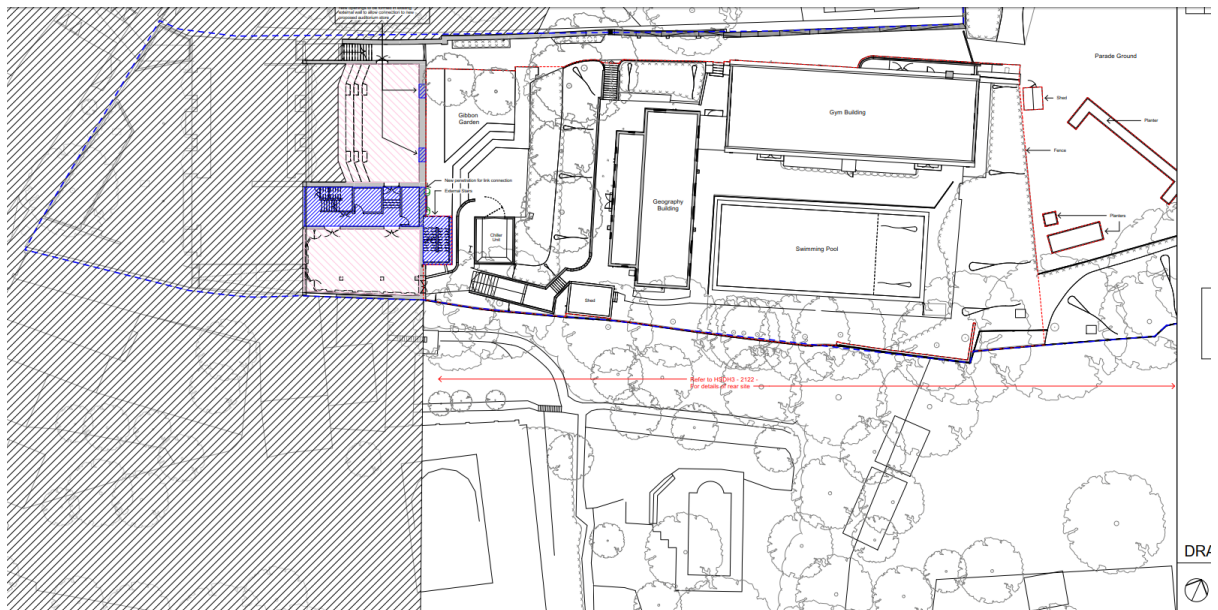
Figure 4 Existing Site Plan



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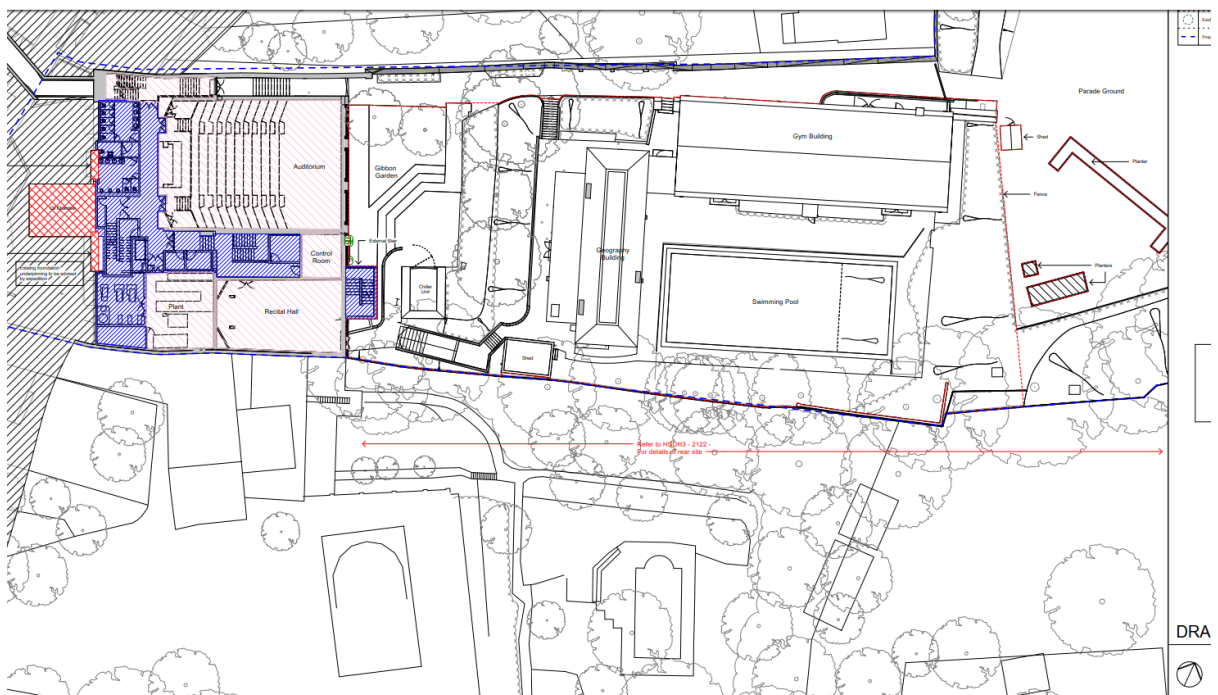
Figure 5, Figure 6 and Figure 7 provides the demolition plans. For further details please refer to the Demolition Plan Binder prepared by Hopkins Architects.

Figure 5 Dyne House Level -02 Demolition Plans



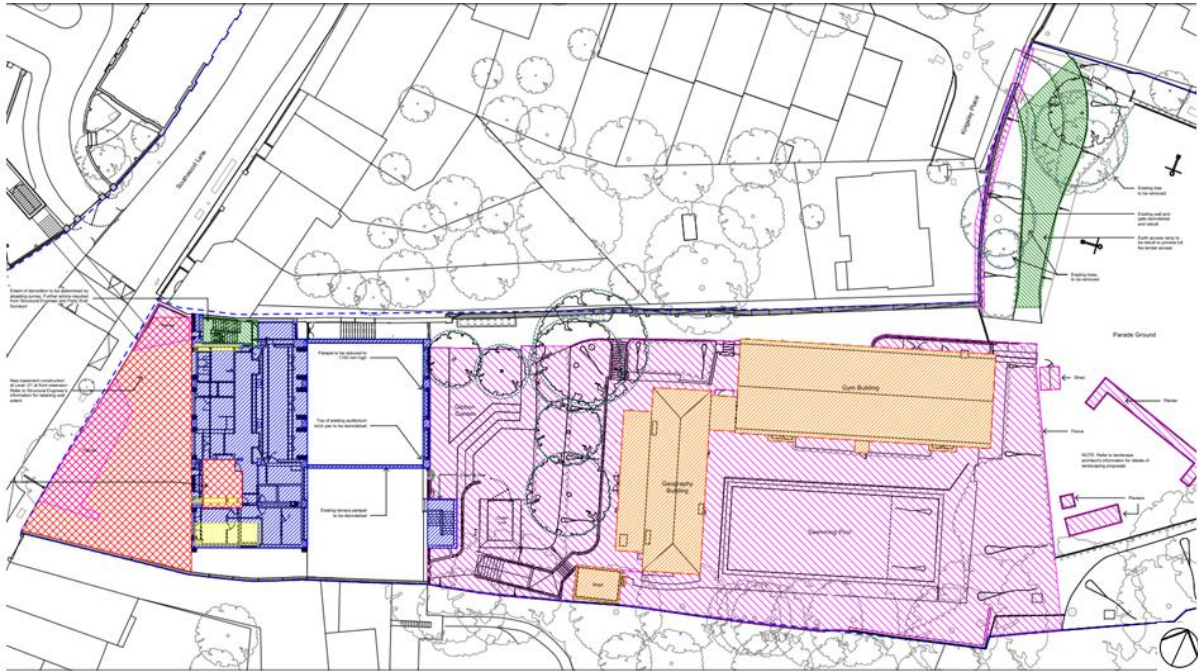
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Figure 6 Dyne House Level -01 Demolition Plan



Please note that this Figure is not drawn to scale

Figure 7 Dyne House Level 0 Demolition Plan



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4. Aims and Objectives

The main aim of the Report is to understand whether the existing buildings, structures and materials can be retained, refurbished, or incorporated into the new 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 Client with this information to assist the Client in maximising the recovery of material for subsequent high grade or value applications.

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
- Identify overall landfill diversion rate for all key materials.

5. Key Principles

The Waste Hierarchy

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.

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 8.

Figure 8 Waste Hierarchy¹



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

The Circular Economy

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.

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 DYNE HOUSE AND ISLAND TUNNEL BUILDING 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.

Figure 9 demonstrates the key stages and principles used when applying the Circular Economy to the built environment.

Figure 9 Applying Circular Economy Principles to Building Design²



² Building Revolutions, David Cheshire, RIBA Publications 2016

6. Methodology

A Site visit was carried out by competent persons: ‘... who has appropriate knowledge of buildings, waste and options for reuse and recycling of different waste streams’

A Site visit was undertaken by Chartered Building Surveyor Tom Lawrence and Chartered Waste and Resource Manager Kat Lees on 20 May 2022.

The Site visit consisted of a non-intrusive visual audit of building fabric to the external and internal parts of the buildings to be demolished.

Subsequently, a workshop was held on 14 June 2022 with the Design Team to discuss the existing conditions of the buildings and the potential to reuse materials on-Site.

Exclusions and Assumptions

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

- 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.
- 5% of the volume of concrete reinforcement is assumed to be steel.
- Information on the pile foundations were assumed, whereas no allowance was made for the removal of foundations or any excavation.
- It is assumed that the demolition would be to the ground floor level.
- 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.
- It is assumed that there will be no insulation in the stud walls.
- Apart from the paving via the central atrium, no other hardstanding has been considered as part of this Report.

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. Key Waste/Materials Identified

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 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.

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

Indicator	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

Please see Table 2 for the location and the quantities of the Concrete found on-Site. Image 1 - Image 4 shows the concrete elements found on-Site.

Table 2 Location and Quantities of Concrete

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	13.75	38.50
Classroom Building, Gymnasium and Swimming Pool	138.25	387.10
Island Site Tunnel	11.20	31.36
Gibbons Garden	5.60	15.68
Total	168.80	472.64

Recommendation

★ For all the concrete elements, it is recommended that the concrete is sent to a local re-processor and crushed off-Site and used as a recycled aggregate. The recycled aggregate can be further used as a construction material for the proposed redevelopment of the Site.

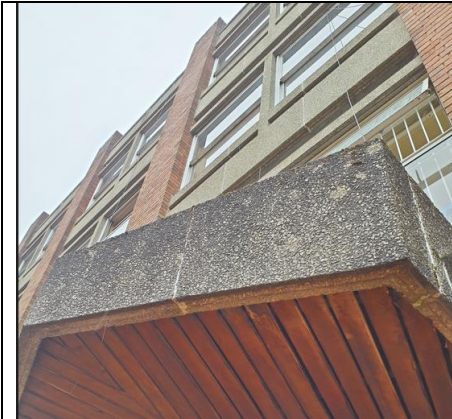


Image 1 Dyne House – Concrete Cladding

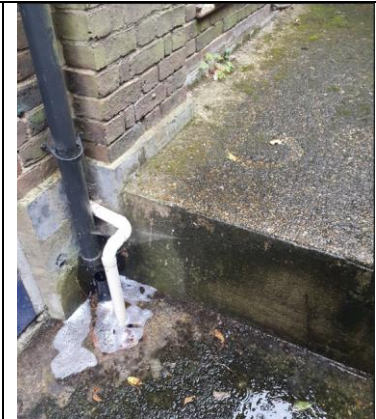


Image 2 Classroom Building, Gymnasium and Swimming Pool – Concrete Slab



Image 3 Island Site Tunnel – Concrete Slab

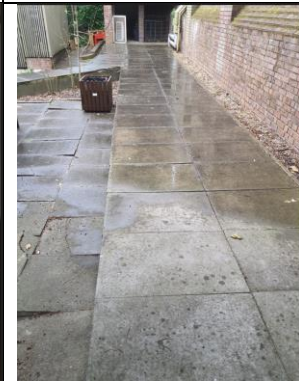


Image 4 Gibson Garden - Concrete Pavement

Bricks

Please see Table 3 for the location and the quantities of Bricks (including external walls) found on-Site. Image 5 - Image 8 shows the bricks found on-Site.

Table 3 Location and Quantities of Bricks

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	78	184.60
Classroom Building, Gymnasium and Swimming Pool	164.10	412.52
Island Site Tunnel	9	24.30
Gibbons Garden	1.44	3.89
Total	252.54	625.31

Recommendation

★ ★ Overall, the bricks are in good condition for reuse. However, these bricks need to be matched with the requirements of the Proposed Development (including colour) prior to reuse. Considering, these do not meet the requirements of the Proposed Development, then these bricks need to be sent off-Site for recycling or reuse (depending the needs of the development).



Image 5 Dyne House - Brick Wall



Image 6 Classroom Building, Gymnasium and Swimming Pool - Brick Wall (External)



Image 7 Island Site Tunnel - Brick Wall (External)



Image 8 Gibson Garden - Bricks Wall (External)

Suspended Grid Mineral Tiles

Please see Table 5 for the location and the quantities of Suspended Grid Mineral Tiles found on-Site. Image 9 shows the Suspended Grid Mineral Tiles found on-Site.

Table 4 Location and Quantities of Suspended Grid Mineral Tiles

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	20.90	62.70
Total	20.90	62.70

Recommendation

★ For all metal found on-Site, it is recommended that it is recycled off-Site.

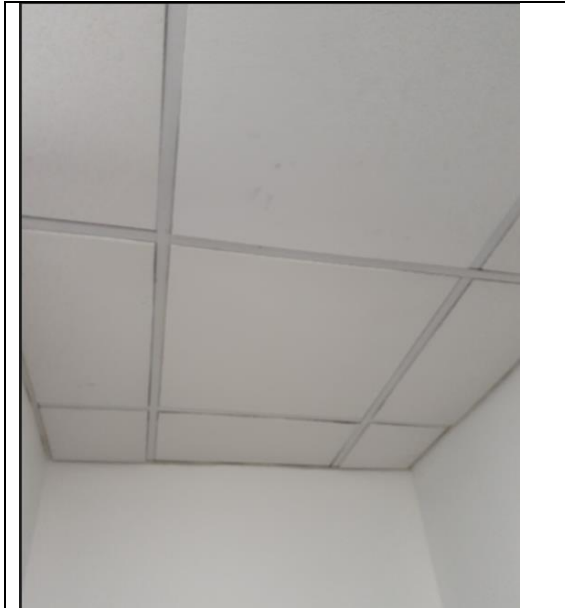


Image 9 Dyne House - Suspended Grid Mineral Tiles

Metals

Please see Table 5 for the location and the quantities of Metals (including aluminium roof) found on-Site. Image 10 - Image 11 shows the metals found on-Site.

Table 5 Location and Quantities of Metals

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	9.01	24.33
Classroom Building, Gymnasium and Swimming Pool	20.80	81.54
Island Site Tunnel	1.60	4.32
Total	31.41	110.19

Recommendation

★ For all metal found on-Site, it is recommended that it is recycled off-Site.



Image 10 Dyne House - Aluminium Window Frame

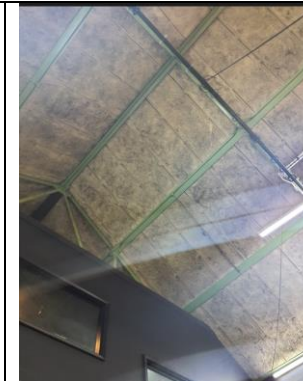


Image 11 Classroom Building, Gymnasium and Swimming Pool - Metal Frame

Timber and Timber Products

Please see Table 6 for the location and the quantities of Timber and timber products (including structural timber and doors) found on-Site. Image 12 - Image 14 shows the timber and timber products found on-Site.

Table 6 Location and Quantities of Timber and Timber Products

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	2.26	1.44
Classroom Building, Gymnasium and Swimming Pool	13.50	8.57
Island Site Tunnel	0.76	0.54
Gibbons Garden	0.10	0.05
Total	16.62	10.61

Recommendation

★ Where high quality solid timber cannot be reclaimed, it is recommended that it is sent for recycling.



Image 12 Dyne House - Timber Door



Image 13 Classroom Building, Gymnasium and Swimming Pool - Fibre Board

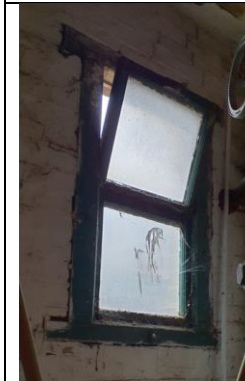


Image 14 Island Site Tunnel - Timber Window

Tiles and Ceramics

Please see Table 7 for the location and the quantities of Tiles and Ceramics (also including Slated Roof Tiles, Water Closets (WC) and Basins) found on-Site. Image 15 - Image 17 shows the tiles and ceramics found on-Site.

Table 7 Location and Quantities of Tiles and Ceramics

Building	Approximate Quantity (m³)	Approximate Quantity of WC's (Number)	Approximate Quantity of Basins (Number)	Approximate Quantity (tonnes)
Dyne house	0.38	6	6	0.75
Classroom Building, Gymnasium and Swimming Pool	24.23	4	4	65.25
Island Site Tunnel	0.19	6	4	0.52
Total	24.79	16	14	66.52

Recommendation

★ Due to the adhesive binding of the tiles, the time required to carefully remove them without breakage, it is recommended that these materials are segregated, so that they can be crushed and recycled off-Site.

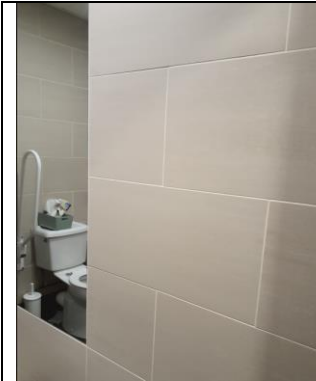


Image 15 Dyne House - Ceramic Tiles



Image 16 Classroom Building, Gymnasium and Swimming Pool - Ceramic Tiles

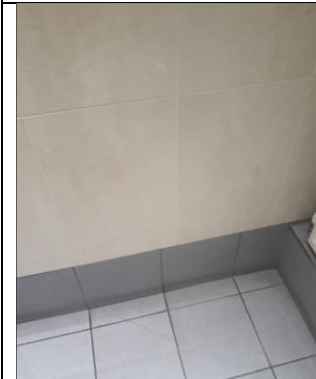


Image 17 Island Site Tunnel - Ceramic Tiles

Plasterboard (Other Gypsum containing material)

Please see Table 8 for the location and the quantities of Plasterboard (other gypsum containing material) found on-Site. Image 18 - Image 20 shows the plasterboard (other gypsum containing material) found on-Site.

Table 8 Location and Quantities of Plasterboard

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	4.50	2.70
Classroom Building, Gymnasium and Swimming Pool	8.53	5.12
Island Site Tunnel	1	0.6
Total	14.03	8.42

Recommendation

★ Reuse of plaster (gypsum materials) is not yet possible, assuming a best case, this material would be recycled.

★ It is currently not possible to separate and recycle plaster from walls. It is therefore envisioned this material would be disposed off.



Image 18 Dyne House - Plasterboard



Image 19 Classroom Building, Gymnasium and Swimming Pool - Plasterboard



Image 20 Island Site Tunnel - Plasterboard

Glass

Please see Table 9 for the location and the quantities of Glass found on-Site. Image 21 - Image 23 shows the Glass found on-Site.

Table 9 Location and Quantities of Glass

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	1.56	4.06
Classroom Building, Gymnasium and Swimming Pool	0.39	1.01
Island Site Tunnel	0.004	0.01
Total	1.95	5.08

Recommendation

★ It is recommended that it be sent off-Site to be crushed and recycled into new products.



Image 21 Dyne House - Glass from Window

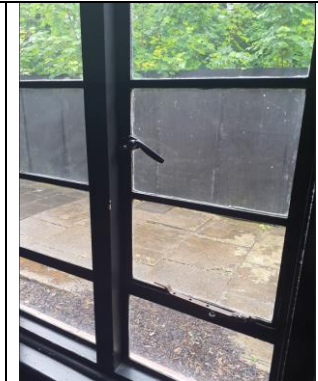


Image 22 Classroom Building, Gymnasium and Swimming Pool - Single Glazed Glass

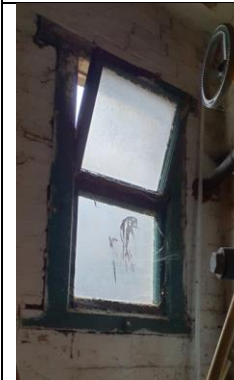


Image 23 Island Site Tunnel - Single Glazed Glass

Textiles

Please see Table 10 for the location and the quantities of Textiles (i.e., carpet tiles) found on-Site. Image 24 - Image 25 shows the carpet tiles found on-Site.

Table 10 Location and Quantities of Textiles

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	5.25	7.88
Classroom Building, Gymnasium and Swimming Pool	2.80	4.20
Total	8.05	12.08

Recommendation

★ ★ Majority of the carpet found on-Site is of good quality and in good condition, therefore, it can be reused off-Site. However, where the condition of carpet is poor, then recycling is recommended.

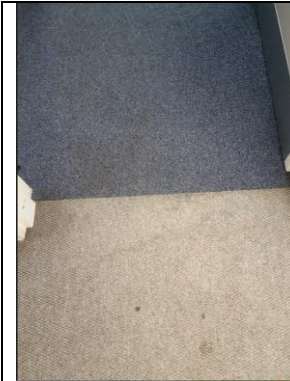


Image 24 Dyne House - Carpet Tiles

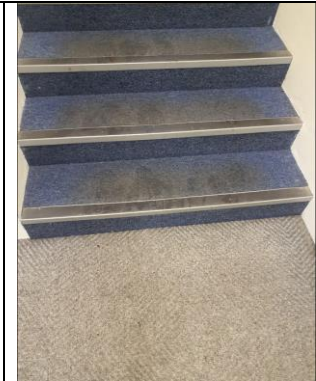


Image 25 Classroom Building, Gymnasium and Swimming Pool - Carpet Tiles

Plastics (including Vinyl Sheets)

Plastics (including vinyl sheets) Please see Table 11 for the location and the quantities of Plastics (including vinyl sheets) found on-Site. Image 26 shows the Plastics (including vinyl sheets) found on-Site.

Table 11 Location and Quantities of Plastics (including Vinyl Sheets)

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	0.60	0.66
Total		

Recommendation

★ It is recommended that the plastics are recycled off-Site (subject to contaminants and the quality).

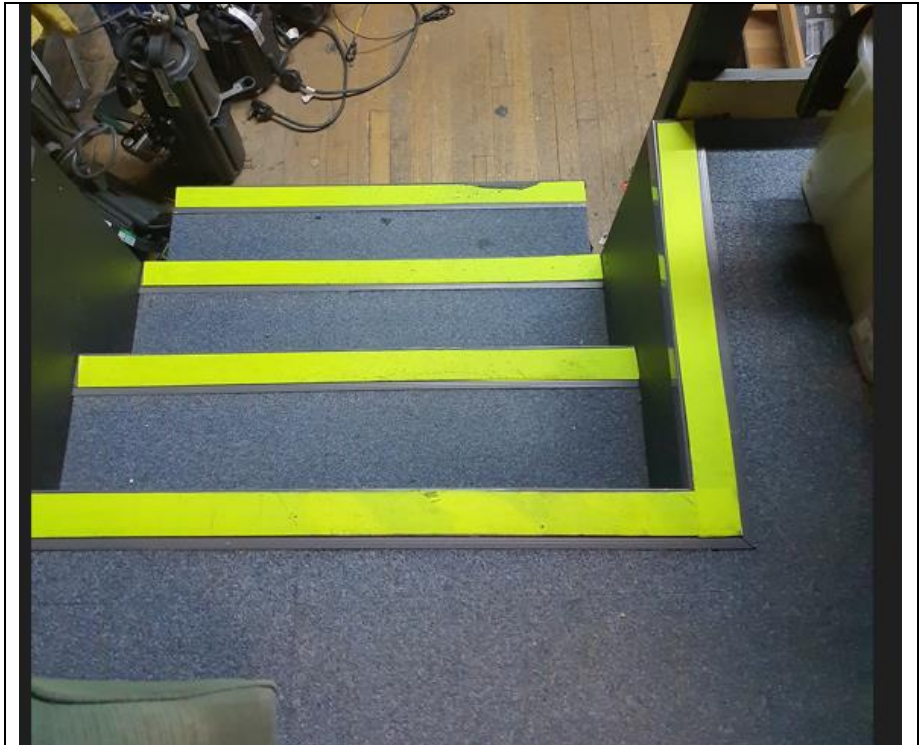


Image 26 Dyne House - Vinyl Flooring

Asphalt (containing bituminous material)

Please see Table 12 for the location and the quantities of Asphalt (containing bituminous material) found on-Site. Image 27 - Image 30 shows the Asphalt (including roofing and hardstanding) found on-Site.

Table 12 Location and Quantities of Bituminous material

Building	Approximate Quantity (m ³)	Approximate Quantity (tonnes)
Dyne house	12.87	18.99
Classroom Building, Gymnasium and Swimming Pool	9.73	17.33
Island Site Tunnel	0.96	1.03
Gibbons Garden	0.88	1.93
Total	24.43	23.87

Recommendation

★ This material should be sent for recycling off-site. In case there is any contamination present then the asphalt cores samples can be taken and tested.



Image 27 Dyne House - Asphalt Roof

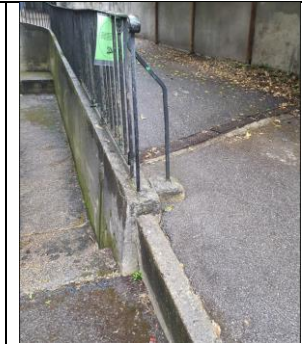


Image 28 Classroom Building, Gymnasium and Swimming Pool - External Hardstanding



Image 29 Island Site Tunnel - Hardstanding



Image 30 Gibbons Garden - External Hardstanding

Lighting

The number of lightbulbs (fluorescent tubes and Light Emitting Diodes (LED)) identified totalled 38. Please see Table 13 for the location and quantities. Image 31 - Image 32 shows the lighting found on-Site.

Table 13 Location and Quantities of Lighting

Building	Approximate Quantity No of Fluorescent Units	Approximate Quantity No of LED
Dyne house	56	
Classroom Building, Gymnasium and Swimming Pool	23	
Island Site Tunnel	2	1
Total	81	1

Recommendation

★ ★ The reuse of lightbulbs and their fixtures is likely impractical; it is therefore likely that LED lighting would be recycled, whereas older incandescent lightbulbs would be sent for energy recovery.

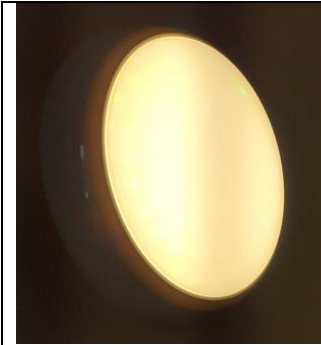


Image 31 Dyne House - Lighting



Image 32 Classroom Building, Gymnasium and Swimming Pool - Lighting

8. Identified Materials Type and Estimated Quantities

Estimated quantities of the materials anticipated to be generated during the demolition process are provided in Table 14. 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 10 and Figure 11 shows the percentage breakdown of waste identified during the Site visit.

It should be noted that the recovery potential provided within Table 14 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 16 provides the quantities the design team intend to use onsite.

Table 14 Estimated Quantities of Materials

Material	European Waste Catalogue Code (EWC)	Volume (m³)	% of Total Volume (m³)	Tonnes (t)	% of Total Tonnage (t)	Recovery Potential (%) (Best Practice) i.e. % diverted from landfill	Recovery Potential (i.e., m³ diverted from landfill)	Disposal to Landfill/ Energy from Waste (m³)	Recovery Potential (i.e., Tonnes diverted from landfill)	Disposal to Landfill/ Energy from Waste (Tonnes)
Concrete	17-01-01	168.80	30%	472.64	33%	100%	168.80		472.64	
Bricks	17-01-02	252.54	45%	625.31	44%	100%	252.54		625.31	
Suspended Grid Mineral Ceiling Tile	17-09-04	20.90	4%	62.70	4.4%	75%	15.68	5.23	47.03	15.68
Metals	17-04-05	31.41	6%	110.19	8%	100%	31.41		110.19	
Timber and Timber Products	17-02-01	16.62	3%	1061	1%	95%	15.79	0.83	10.08	0.53
Tiles and Ceramics	17-01-03	24.79	4%	66.52	5%	100%	24.79		66.52	
Plasterboard (other gypsum containing materials)	17-08-02	14.03	2%	8.42	1%	95%	13.32	0.70	7.99	0.42
Glass	17-02-02	1.95	0.3%	5.08	0.4%	100%	1.95		5.08	
Textiles	20-01-11	8.05	1%	12.08	1%	100%	8.05		12.08	
Plastics (including vinyl sheets)	17-02-03	0.60	0.1%	0.66	0.05%	100%	0.60		0.66	
Asphalt containing (bituminous material)	17-03-03	24.43	4%	39.27	3%	95%	23.21	37.31	1.22	1.96
Total		564.12	100%	1,413.46	100%		556.14	7.98	1,394.87	18.59

The % might not add up to 100% due to rounding

The numbers may not add up due to rounding

Figure 10 Approximate Quantities of Materials (%) by Volume

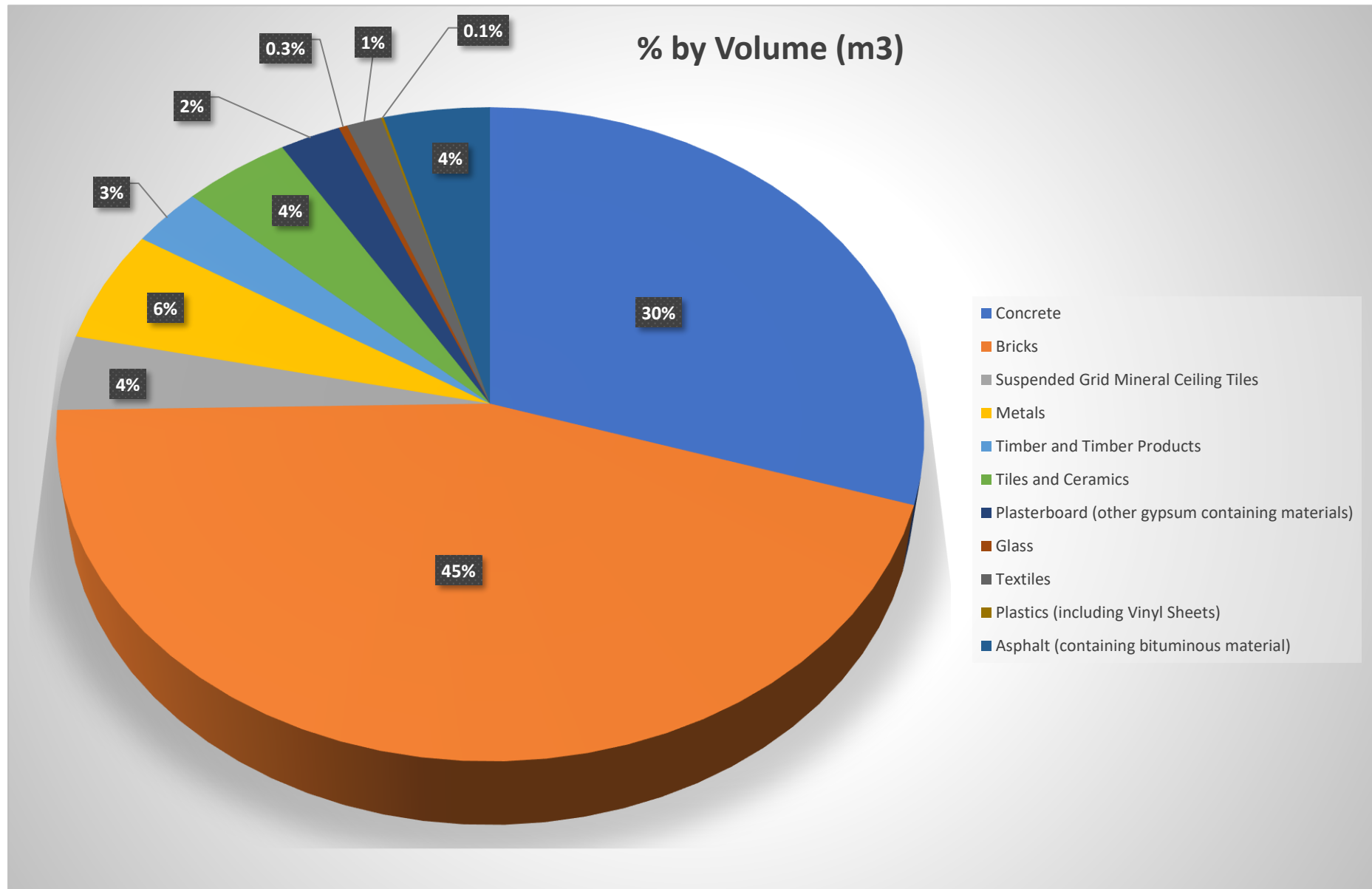
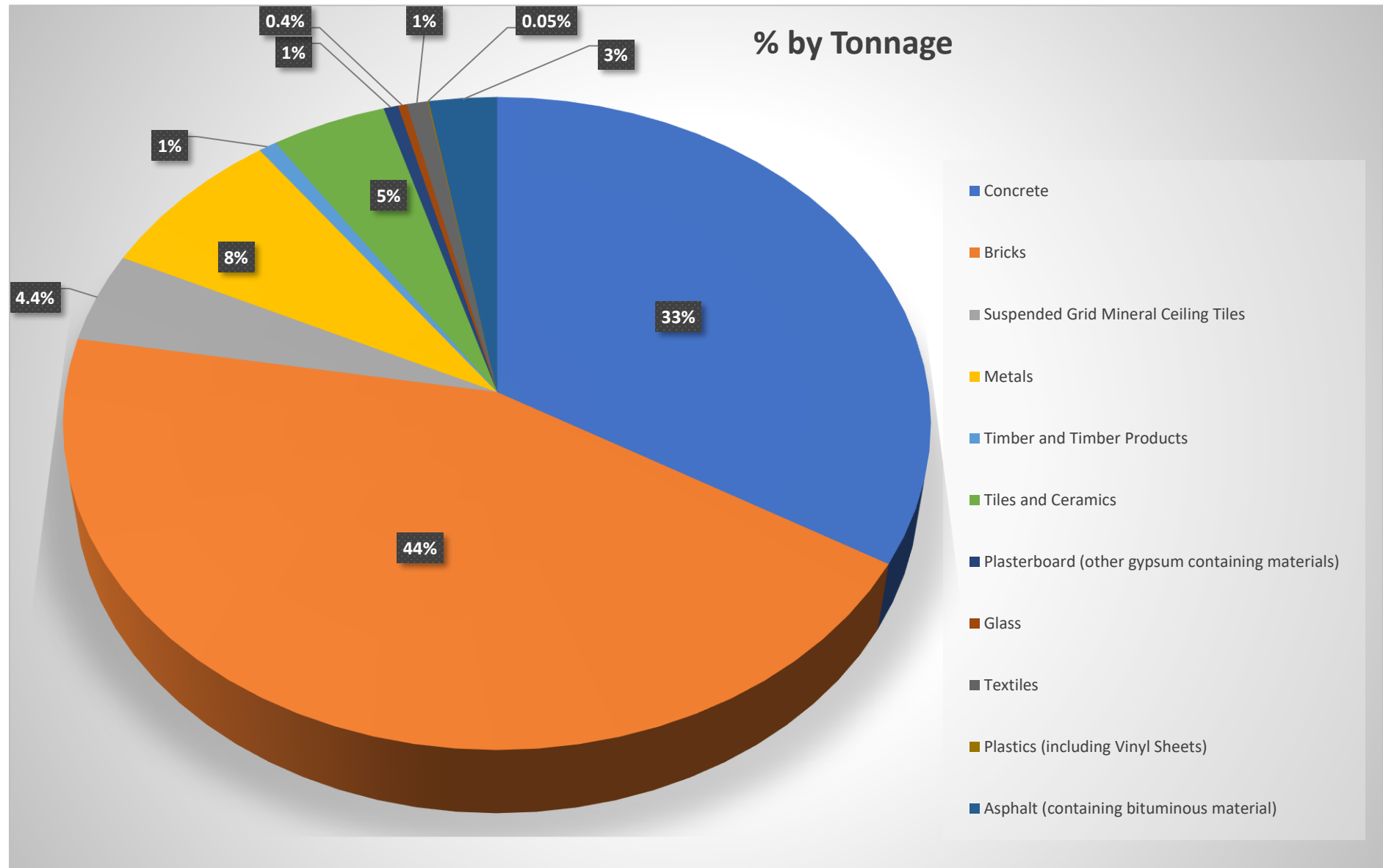


Figure 11 Approximate Quantities of Materials by Weight (tonnage)



It can be noted from Table 14, that approximately 99% of the demolition waste can be recovered.

9. Waste Management Opportunities

A workshop was held with the design team (including but not limited to the structural engineers, landscaping architects and the design team) on 14 June 2022. The purpose of the workshop was to discuss the condition of the existing buildings to understand whether these buildings or any components can be retained. Within this workshop 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.

The key provided in Table 15 has been adopted to show the opportunity of each waste/material identified.

Table 15 Opportunities Key

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

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 16.

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 16 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 16 Waste Reduction Opportunities

Material Type	Circularity Rating	Suggestion					Opportunity	Constraints	Example Reprocessors
		on-Site reuse	on-Site recycling	off-Site reuse	off-Site recycling	off-Site Disposal			
Concrete	★	At this stage it is assumed that approximately 65 m3 of concrete subbase will be crushed and reused on-Site. This forms about 40% (by volume) of the overall concrete. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be reused on-Site.	At this stage it is assumed that 0% (by volume) of concrete will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site. if on-Site crushing is allowed (considering the noise and dust constraints), then the crushed material can be used as bulk fill in areas, where the levels are built up.	Based on the condition and quality (subject to testing) approximate 50% (by volume) of the remaining material would be – Reuse off-Site.	Based on the condition and quality (subject to testing) – approximate 50% (by volume) of the remaining material would be recycled off-Site.	At this stage it is assumed that 100% of this material would either be re-used or recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated.	A list of recycling companies that collect crushed aggregate are provided in Table 17.

Bricks	 	At this stage it is assumed that 0% (by volume) of bricks will be reused on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be reused on-Site.	At this stage it is assumed that 0% (by volume) of bricks will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site. if on-Site crushing is allowed (considering the noise and dust constraints), then the crushed material can be used as bulk fill in areas, where the levels are built up.	Based on the condition and quality (subject to testing) approximate 50% (by volume) would be – Reuse off-Site.	Based on the condition and quality (subject to testing) – approximate 50% (by volume) would be recycled off-Site.	At this stage it is assumed that 100% of this material would either be re-used or recycled and therefore not be subject to disposal to landfill.	   	Additional space to keep materials segregated to then transport off-Site for crushing. Additional time in the demolition programme will have to be allowed and it is likely to incur increased demolition costs, however, there will be a resale value for the bricks, and it would considerable reduce the amount of material that is downcycled for secondary aggregates.	Globe Chain is a reuse marketplace that connects companies with charities, Small and Medium size Enterprises (SME) and individuals to redistribute unneeded construction material while collating social, environmental and economic data GlobeChain https://www.globechain.co.uk Salvage opportunities for bricks: https://www.salvoweb.com
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Suspended Grid Mineral Ceiling Tiles	 	At this stage it is assumed that 0% (by volume) of this material will be reused on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be reused on-Site.	At this stage it is assumed that 0% (by volume) of this material will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site.	Based on the condition and quality (subject to testing) approximate 50% (by volume) would be – Reuse off-Site.	Based on the condition and quality (subject to testing) – approximate 50% (by volume) would be recycled off-Site.	At this stage it is assumed that 100% of this material would either be re-used or recycled and therefore not be subject to disposal to landfill.	   	Additional space required to keep material segregated.	Armstrong Ceiling Solutions have a recycling service for acoustic ceiling tiles https://www.armstrongceilingsolutions.co.uk/en-gb/performance/sustainable-building-design/recycling-programmes
Metals		At this stage it is assumed that 0% (by volume) of metal will be reused on-Site.	At this stage it is assumed that 0% (by volume) of this material will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on site.	0% (by volume) will be reused off-Site	Based on the condition and quality (subject to testing) - 100% (by volume) would be recycled off-Site	At this stage it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.	   	Additional space to keep materials segregated.	EMR Scrap Metal http://www.emrgroup.com/

Timber and Timber Products		At this stage it is assumed that 0% (by volume) of timber will be reused on-Site.	At this stage it is assumed that 0% (by volume) of this material will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site.	Based on the condition and quality (subject to testing) approximate 50% (by volume) would be – Reuse off-Site.	Based on the condition and quality (subject to testing) – approximate 50% would be recycled off-Site.	At this stage it is assumed that 100% of this material would either be re-used or recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated. .	Globechain https://www.globechain.co.uk Community Wood Recycling can reclaim wood and reuse it: https://www.communitywoodrecycling.org.uk/
Tiles and Ceramics		At this stage it is assumed that 0% (by volume) of tiles and ceramics will be reused on-Site.	At this stage it is assumed that 0% (by volume) of this material will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site.	0% (by volume) will be reused off-Site	Based on the condition and quality (subject to testing) - 100% (by volume) would be recycled off-Site	At this stage it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated.	https://www.globechain.co.uk

Plasterboard (other gypsum containing materials)	 	At this stage it is assumed that 0% (by volume) of plasterboard and other gypsum containing materials will be reused on-Site.	At this stage it is assumed that 0% (by volume) of this material will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site.	0% (by volume) will be reused off-Site	Based on the condition and quality (subject to testing) - 100% (by volume) would be recycled off-Site	Based on the condition and quality (subject to testing) – some material may be disposed off-Site		Additional space to keep materials segregated. .	British – Gypsum https://www.britisht石膏.com/about-us/csr/environmental-challenges/plasterboard-recycling Junk Removal London provides collection services for plasterboard: http://junkremovalsolutions.com/plasterboard-collection/
Glass		At this stage it is assumed that 0% (by volume) of glass will be reused on-Site.	At this stage it is assumed that 0% (by volume) of this material will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site.	0% (by volume) will be reused off-Site	Based on the condition and quality (subject to testing) - 100% (by volume) would be recycled off-Site	At this stage it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.		Additional space to keep materials segregated. .	May Glass Recycling: https://www.mayglassrecycling.co.uk/services Nationwide Waste Services: https://www.nationwidewasteservices.co.uk/recycling/ Guardian Glass https://www.guardianglass.com/gb/en Pilkington Glass Manufacturing https://www.pilkington.com/

Textiles	 	At this stage it is assumed that 0% (by volume) of this material will be reused on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be reused on-Site.	At this stage it is assumed that 0% (by volume) of this material will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site.	0% (by volume) will be reused off-Site	Based on the condition and quality (subject to testing) - 100% (by volume) would be recycled off-Site	At this stage it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.	   	Additional space to keep materials segregated. .	Carpet Recycling UK: https://carpetrecyclinguk.com/ Envirocycle London: a carpet tile reuse programme https://envirocyclelondon.com/recycle-office-carpet-tiles/ Interface - carpet supplier offering a take back scheme for carpet reuse https://www.interface.com/EU/en-GB/campaign/reentry/reentry-en_GB
Plastics (including Vinyl Sheets)		At this stage it is assumed that 0% (by volume) of plastic (including vinyl sheets) will be reused on-Site.	At this stage it is assumed that 0% (by volume) of this material will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site.	0% (by volume) will be reused off-Site	Based on the condition and quality (subject to testing) - 100% (by volume) would be recycled off-Site	At this stage it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.	   	Additional space to keep materials segregated.	Recovynil offers a takeback scheme for vinyl flooring via Axion Group: https://axiongroup.co.uk/services/specialist-collection-schemes/recovynil/

Asphalt (containing bituminous material)	★	At this stage it is assumed that 0% (by volume) of asphalt will be reused on-Site.	At this stage it is assumed that 0% (by volume) of this material will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site.	0% (by volume) will be reused off-Site	Based on the condition and quality (subject to testing) - 100% (by volume) would be recycled off-Site	At this stage it is assumed that 100% of this material would be recycled and therefore not be subject to disposal to landfill.	  	Additional space to keep materials segregated.	A list of recycling companies that collect crushed aggregate are provided in Table 17
Lighting	★ ★	At this stage it is assumed that 0% (by volume) of lighting will be reused on-Site.	At this stage it is assumed that 0% (by volume) of concrete will be recycled on-Site. However, it is proposed that a specialised contractor is taken on board during the demolition and construction phase, who will re-evaluate the quality of the material and incorporate measures that will allow some % of this material to be recycled for use on-Site.	At this stage it is assumed that 0% (by volume) of metal will be recycled on-Site.	Only low energy light bulbs and fluorescent light tubes are recyclable. Incandescent (old-fashioned) light bulbs cannot be recycled. Therefore, 100% (by volume) would be recycled off-Site	Based on the condition and quality (subject to testing) – some material may be disposed off-Site	  	Additional disposal costs.	Recolight: https://www.recolight.co.uk/ BPR Group http://www.bprgroup.co.uk/ Globechain https://www.globechain.co.uk Salvo https://www.salvoweb.com/

Waste contractors in the area that collect multiple construction streams (segregated) are shown in Table 17. 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 17 Waste Companies in London, which collect multiple Construction, Demolition and Excavation (CD&E) Waste Streams

Waste Company
Capital Waste www.Capwaste.co.uk
London Waste Removal Service www.Londonwasteremovalservic.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/

10. General Guidance for Management of Demolition Materials and Waste

This pre-demolition and pre-redevelopment audit have been conducted to allow material and waste management to be considered in the early stage of the project. The Client, 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).

The reuse of material on-Site or on a nearby similar project is the ideal option from an environmental and economic perspective. The Client and Architect are best positioned to consider these options and enable these initiatives. Doing so also often results in reduced transportation, reducing embodied CO₂ 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 Client 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.

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.

11. Recommendations and Next Steps

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.

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 contractor should refer to the Pre-Demolition and Pre-Redevelopment Audit Report in the SWMP/CRMP.

12. Further Information

In addition to the resources detailed in Table 16, 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>

13. References

- Ref. 1 Greater London Authority (GLA), (2022); London Plan Guidance – Circular Economy Statements
- Ref. 2 GLA, (2021); The London Plan – The Spatial Development Strategy for Greater London