Figure 16 BMU unit and rails

Figure 17 Handrails example

Figure 18 Steel gates example

If the metal components can't be reused, the companies listed in Table 12 may be considered to manage the metal waste.

Table 12 Local waste management companies - Metals

Company	Website
Capital Metal Recycling	http://capitalmetalrecycling.co.uk
London Scrap Metal Recycling	http://www.londonscrapmetalrecycling.com
EMR Group	http://www.emrgroup.com

3.4 Ceramics

An estimated 177 tonnes of ceramics (80m^3, approximately 2% of the KDPs by Weight; EWC: 17 01 03) is expected to arise from demolition. The ceramic sources include ceramic tiles (walls and floors of bathrooms and kitchens, pavers, basins, toilet pans, urinals and tiles from the office building floors).

Ceramic materials are unlikely to be reusable. It is recommended that these are crushed with inert waste on-site and used to produce recycled aggregate.

Depending on their conditions, toilet pans, urinals, and basins may be reclaimed and repurposed. The platform Salvo (https://www.salvoweb.com) may be considered to trade any reclaimed components suitable for reuse.

3.5 Plaster and plasterboards

Approximately 107 tonnes of plasters (165m^3) are expected to arise from demolition (approximately 1% of the KDPs by Weight; EWC: 17 08 02). The plaster sources are mainly plasterboards throughout the buildings and possibly plaster skim used on the internal brick/block walls.

If some plasterboards are suitable for reclamation and reuse, the platform Salvo (https://www.salvoweb.com) may be considered for trading the reclaimed panels.

If possible, plasterboards should be segregated on-site or alternatively at a waste transfer station. Several companies within the London area offer recycling services for plasterboards as long as the plasterboards are relatively free from contamination. Some recycling routes can include being used in the plasterboard manufacturing process (check with the waste/recycling company for their recycling routes). If it is sent to disposal, it should be landfilled separately from the other waste. Waste management companies/platforms for plaster products are given in Table 13.

Table 13 Local waste management companies – Plaster products

Company	Website
Powerday	https://www.powerday.co.uk
Plasterboard Recycling Solutions	http://www.plasterboardrecyclingsolutions.co.uk
Hinton's Waste	https://www.hintonswaste.co.uk/recycling-facilities/plasterboardrecycling
Hippo Waste (collected in bags)	https://www.hippowaste.co.uk/blog/plasterboardrecycling-removal
RTS Waste Management	https://www.rtswaste.co.uk/plasterboard-mobilecompaction-service

3.6 Glass

The glass will arise from windows and balustrades. The total amount of glass is estimated to be about 77 tonnes (approximately 1% of the KDPs by Weight (EWC: 17 02 02). Other sources of glass include internal glazed partitions, which were not included in the assessment.

Whilst some schemes will take back flat glass for recycling unless the glass is reclaimed as part of components (say external glazing or doors), it is recommended to be crushed into aggregate with the other inert waste. If it is to be segregated on-site for reuse/recycling, health and safety considerations are required for the workforce as it needs to be handled carefully.

The glazed balustrades are in good condition and relatively easy to deconstruct and reclaim. The platform Salvo (https://www.salvoweb.com) may be considered for trading the reclaimed components.

Table 14 Local waste management and recycling companies – Glass

Company	Website
May Glass Recycling	https://mayglassrecycling.co.uk
Viridor	https://www.viridor.co.uk
RTS Waste	https://www.rtswaste.co.uk
Berryman Glass Recycling	https://www.urmgroup.co.uk

The figures below illustrate the glass sources.

Office Building and Dressing rooms

Rehearsal Room

Figure 19 Glazed façades

Figure 20 Internal glazed partitions

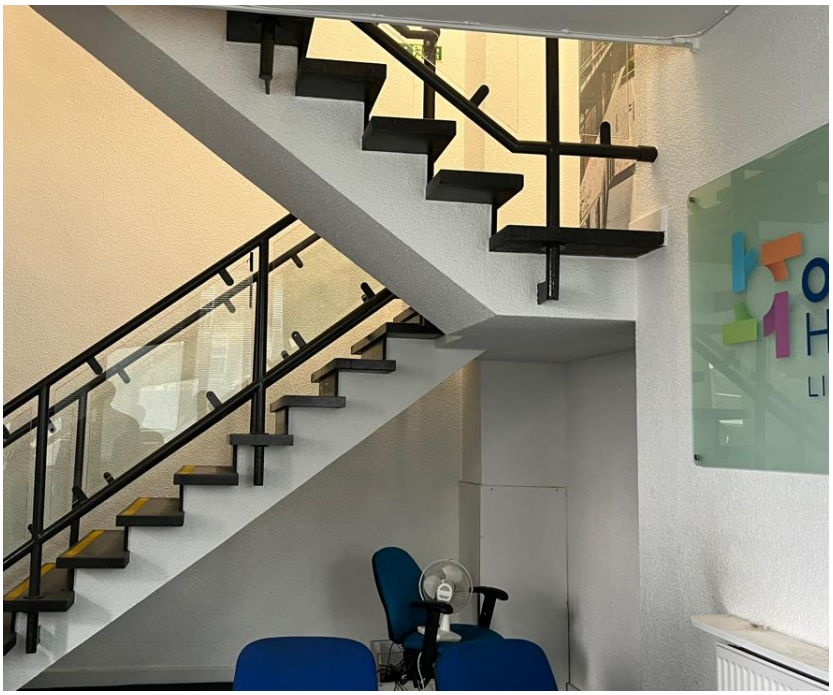

Figure 21 Stairs balustrades

3.7 Timber

There are an estimated 75 tonnes (188m^3) of timber-based components arising from demolition (< 1% of the KDPs by Weight). The timber sources are mainly timber framing, studwork and chipboards. Other sources include office and common areas furniture or temproaty fences, which were not included in the assessment.

Most of the solid timber can be recycled, usually into chipboard. The panel-based products will be suitable for energy recovery. Some timber may be hazardous due to the coatings and preservatives used. It is recommended that local wood recycling organizations are contacted to see what timber items (if any) are suitable for reclamation and reuse.

Where reclamation is impossible, the timber should be segregated on-site or offsite and sent to a licensed waste management contractor for recycling. For the current building, the amount of timber which can be reclaimed and reused is expected to be small (these may include fit-out items).

Local waste management companies or platforms to pursue the reclamation and reuse of the timber components are given in Table 15. Guidance on wood waste assessment is also provided.

Table 15 Waste management guidance and companies - Timber

Company	Website
Waste Wood Assessment Guidance	https://condemwaste.org/wp-content/uploads/2021/07/CIWM-CD-Waste-Wood-Guide-v1.0.pdf
Community Wood Recycling	https://communitywoodrecycling.org.uk
Solo Wood Recycling	www.solowoodrecycling.co.uk
Salvo	https://www.salvoweb.com

3.8 Bitumen

Bitumen or asphalt account for an estimated 56 tonnes of KDP (<1% of the KDPs by weight; EWC: 17 03 01). The bitumen arises from the external accesses, feld and asphalt on the roofs.

The bitumen should be suitable for reprocessing into new surfacing material. Samples can be taken to determine any coal tar content, which might result in it being deemed hazardous waste. The asphalt on the roof and roofing felt may also be deemed as hazardous.

Guidance on Managing Reclaimed Asphalt can be found in the following ADEPT publication:

https://adeptnet.org.uk/system/files/documents/ADEPT%20Guide%20to%20Managing%20Reclaimed%20Asphalt%20Version%202019%20Rev%201.pdf

Bitumen should be processed aligned with the Quality Protocol for inert waste. Potential recycling routes include sub-base, capping or used in hot-mix asphalt (dependent upon the amount of coal tar) and other bituminous mixes. The waste management companies suggested for concrete and bricks (Table 5 and Table 7, respectively) should be able to manage the bitumen waste.

Figure 22 Roofing felt – office

Figure 23 Roofing felt – rehearsal and workshop

Figure 24 Bitumen – external accesses

3.9 Insulation

It is expected that approximately 12 tonnes of insulation (232m^3) will arise from the brick walls and phenolic insulation on the pipework of foams to complete local remediations throughout the building (<1% of the KDPs by Weight; EWC: 17 06 04).

Recovery of insulation material is unlikely to be possible if it is bonded to the substrate. If the insulation panels can be segregated on-site, they may be reclaimed for future use. Second-hand Rockwool panels have been found in the market (https://www.claddingwarehouse.co.uk/products/100mm-rockwool-second-use).

Typically, insulation is disposed of at a landfill via a licensed waste management contractor or could be sent for energy recovery if foam-based insulants can be successfully disaggregated. Care should be taken to ensure that insulation containing ozone-depleting substances is removed and handled carefully.

The options for recycling insulation arising from a construction site include:

- returning materials through take-back schemes offered by manufacturers;
- compressed stone wool ceiling tile manufacture;
- reclamation and reprocessing after removing impurities such as screws and nails;

However, the process still faces some barriers, such as:

- insulation arising from demolition can be contaminated (e.g., by mortar, wood, bitumen or asbestos);
- greenhouse gas emissions generated from breaking rigid urethane insulation;
- lack of specialised recycling facilities;
- lack of end markets;
- the low value of insulation material;
- due to the low density of the panels, large storage areas are needed;

Table 16 proposes some pioneering projects to recycle insulation materials.

Table 16 Pioneering projects to recycle insulation materials

Company	Website
Knauf	https://www.knaufinsulation.com/news/how-knauf-insulation-driving-recycling-for-a-better-world
Rockwool	https://www.rockwool.co.uk/about/sustainability/recycling
Kingspan	https://www.kingspan.com/gb/en-gb/products/insulation-boards/resources/sustainability-and-responsibility/waste-take-back-scheme

Local waste management companies shall be consulted. Two examples are given in Table 17.

Table 17 Examples of waste management companies - Insulation

Company	Website
londonwastemanagement	https://www.londonwastemanagement.com/product/insulation
businesswaste	https://www.businesswaste.co.uk/plastic-recycling/foam-waste-disposal

3.10 Plastics

The amount of plastic arising from demolition is expected to be about 10 tonnes (66m^3, <1% of the KDPs by Weight; EWC 17 02 03). The sources of the plastic are ceiling elements, vinyl, and a small amount of roofing membranes.

Other sources of plastic may include uPVC windows/doors, pipework, guttering, cabling, etc.

Plastic is likely to be sent for sorting at a waste transfer station and later for incineration.

If any uPVC windows or doors are reclaimed, the initiative included in Table 18 may be considered:

Table 18 Platform for trading existing ceramics

Company	Website
axiongroup	https://axiongroup.co.uk/services/specialist-collection-schemes/recovinyl

Schemes such as the one outlined in Table 19 below are examples of businesses that will recycle old vinyl flooring depending on the material quality and amount of screed left over on it. As a material, vinyl is perfectly suited for recycling and can be recycled multiple times without quality loss. If the vinyl can't be recycled, it can be incinerated to generate energy.

Table 19 Vinyl take-back scheme

Company	Website	Comments
Recofloor	http://www.recofloor.org/about-us/#specifications	Vinyl take-back scheme. Sustainable collection service.

3.11 Carpet

An estimated 5 tonnes of carpet is emerging from the demolition (26m^3, <1% of the KDPs by Weight; EWC 20 01 11). The condition of the carpet may vary. Depending on its condition, the carpet can be recycled or reused.

Table 20 Examples of platforms and companies to enable the recycling or reuse of components – carpets.

Company	Website	Comments
Reuse Network	https://reuse-network.org.uk/	A generic platform that could accept large volumes of domestic carpet donations.
FreeCycle	https://www.freecycle.org/	A generic platform that could help resell small volumes of domestic carpets.
Carpet Recycling UK	https://carpetrecyclinguk.com/	Non-profit association working to reduce the amount of carpet waste being sent to landfill

3.12 WEEE

A number of Waste Electrical and Electronic Waste Equipment (WEEE; EWC 16 02 14) will arise from demolition, mainly lights and other equipment.

Any fluorescent lighting should be segregated on-site, collected and disposed of by a licensed hazardous waste contractor. Any waste electrical and electronic equipment should be separated on-site and sent to a specialist recycling facility. Alternatively, schemes like those presented in Table 21 may be considered.

Several M&E equipment is present on the site, namely on the roofs of the buildings and plant room.

Table 21 Local waste management and recycling companies – WEEE

Company	Website
Pure Planet Recycling	https://www.pureplanetrecycling.co.uk/WEEEe-recycling-london
Junkwize	https://junkwize.com/commercial/WEEEe-recycling-disposal-london/
Recolight	https://www.recolight.co.uk

If items are in good condition, they could be donated or advertised on suitable platforms (Table 22).

Table 22 Platform for trading existing WEEE

Company	Website
London Reuse	https://www.reusefuluk.org/
Salvo	https://www.salvoweb.com

The figures below illustrate the WEEE sources arising from demolition.

Figure 25 M&E equipment (office roof)

Figure 26 M&E equipment (workshop roof)

Figure 27 M&E equipment (workshop roof)

Figure 28 WEEE equipment (office)

4 Embodied carbon assessment of the KDPs

The embodied carbon calculation was completed following the guidelines proposed by the Institution of Structural Engineers[1]. The following assumptions were considered for the embodied carbon assessment:

- GIA: 4560 m^2
- Approximate construction value: 14M

The construction value and GIA are considered to assess the carbon burdens for modules A5 and C1 of the whole project, respectively. The carbon burdens of such modules were distributed proportionally to the weight of each product listed in Table 23.

The assessment considered the following EPDs for the hot-rolled steelwork and cladding:

- British Steel EPD: https://britishsteel.co.uk/media/342251/british-steel-rails-sections-epd.pdf

The British Steel EPD represents a typical UK-sourced Blast Furnace steel, likely to be the provenance of the existing hot rolled steelwork.

Table 23 presents the results of an embodied carbon assessment for the key demolition products. Although the assessment does not account for all materials listed in Table 2, approximately 97% of the KDPs by weight are covered. The carbon breakdown is illustrated graphically in Figure 29.

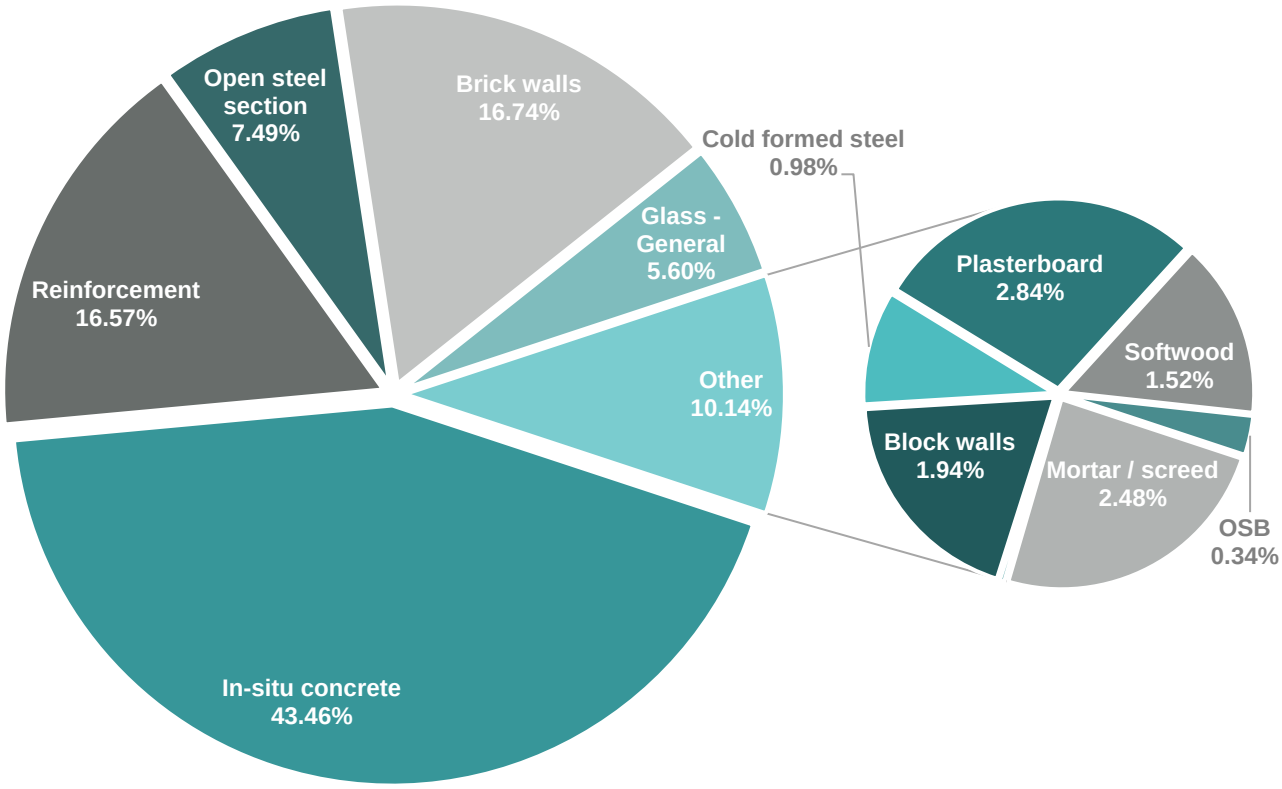

Figure 29 Embodied carbon breakdown of the KDPs.

[1] "How to Calculate Embodied Carbon", Second Edition, IStructE, 2022

Table 23 Embodied carbon assessment of the KDPs

Material Type	Material Specification	Material Quantity [kg]	Embodied carbon – [tCO_{2e}]									
			Production	Construction		Use	End-of-life		Recycling & Reuse	Biogenic Carbon	Embodied Carbon - Total	% - Embodied carbon breakdown
			A1-A3	A4	A5	B1-B5	C1	C2-C4	D			
In-situ concrete	UK C32/40 (25% GGBS)	5804980	696.6	29.0	114.1	NA	11.1	104.7	0.0	0.0	955.5	43.5%
Mortar/screed	1:4 cement:sand mix avg UK cement mix	279306	41.6	1.4	5.9		0.5	5.0	0.0	0.0	54.5	2.5%
Concrete Pavers	UK C16/20 (0% SCM)	5400	0.6	0.0	0.1		0.0	0.1	0.0	0.0	0.8	0.0%
Block walls	PCC Lightweight (AAC) blocks	106596	29.8	1.2	9.5		0.2	1.9	0.0	0.0	42.7	1.9%
Reinforcement	UK 97% recycled EAF production	420188	319.3	13.4	23.1		0.8	7.6	147.5	0.0	364.3	16.6%
Steel	Steelwork - British steel EPD	65253	159.9	2.1	2.0		0.1	0.6	-104.4	0.0	164.6	7.5%
Cold-formed steel	Global hot dip galvanised	7201	19.9	1.3	0.3		0.0	0.1	-9.5	0.0	21.6	1.0%
Brick walls	UK: BDA generic brick	1163046	247.7	12.8	84.4		2.2	20.9	-18.6	0.0	368.1	16.7%
Glass - General	General	77757	112.0	2.5	7.1		0.1	1.4	0.0	0.0	123.1	5.6%
Plasterboard	Partitioning/ceilings (min 60% recycled content)	107432	41.9	3.4	15.0		0.2	1.9	0.0	0.0	62.5	2.8%
Softwood	Softwood, 100% FSC/PEFC	64823	17.0	10.4	4.0		0.1	108.1	-34.0	-106.3	33.4	1.5%
OSB	OSB 100% FSC/PEFC	10209	4.6	1.6	0.9		0.0	17.0	0.0	-16.7	7.4	0.3%
Totals:		**8112190**	1691.0	79.3	266.4	-	15.5	269.4	-19.0	-123.1	2198.6	100.0%
% - Modules:			76.9%	3.6%	12.1%	-	0.7%	12.3%	-0.9%	-5.6%	100.0%	-

5 Guidance to maximize reuse and proposed reuse targets

Careful planning is required to maximize the reuse of products reclaimed from the existing building. Typically, the opportunities to reuse reclaimed elements are increased if the elements are reused on the same site or by the same owner. Alternatively, the reclaimed components may be sold or given away locally to minimize transportation costs. For components with increased value (such as a steel frame or structure), opportunities may arise from specialist stockists/dealers across the country.

Table 24 lists items that may be suitable for reuse and proposed reclamation targets. Setting aside storage on-site to segregate salvage items may increase their reuse opportunities. The recommendations given in section 3 shall be considered.

Table 24 Propose reuse targets

Items	Volume (m^3)	Mass (tonnes)	Reuse	Reused Volume (m^3)	Reused weight (tonnes)
Steelwork (hot rolled)	9.51	65.25	100%	9.51	65.25
Cold-formed steelwork	0.70	5.46	50%	0.35	2.73
Steel sheet	0.92	7.20	50%	0.46	3.60
Bricks	612.13	1163.05	50%	306.07	581.52
Concrete pavers	4.50	5.40	50%	2.25	2.70
Timber framing	147.32	64.82	30%	44.20	19.45
Plasterboards	164.72	107.43	30%	49.42	32.23
Existing steel stairs	-	-	100%	-	-
Steel gates	-	-	100%	-	-
Balustrades/railings	-	-	50%	-	-
WEEE	-	-	50%	-	-
Doors and fire doors	-	-	50%	-	-
Timber cupboards, cabinets, desks and tables	-	-	25%	-	-
Total			**-**	**412.24**	**707.48**

Table 23 shows an opportunity to reclaim and reuse approximately 707 tonnes of materials (about 8% of the KDPs by weight). These figures do not include reusing inert waste as fill on-site.

The information in Table 24 is represented graphically in Figure 30 and Figure 31.

Table 25 lists examples of organizations and platforms which may be considered to maximize the reuse potential of the KDPs.

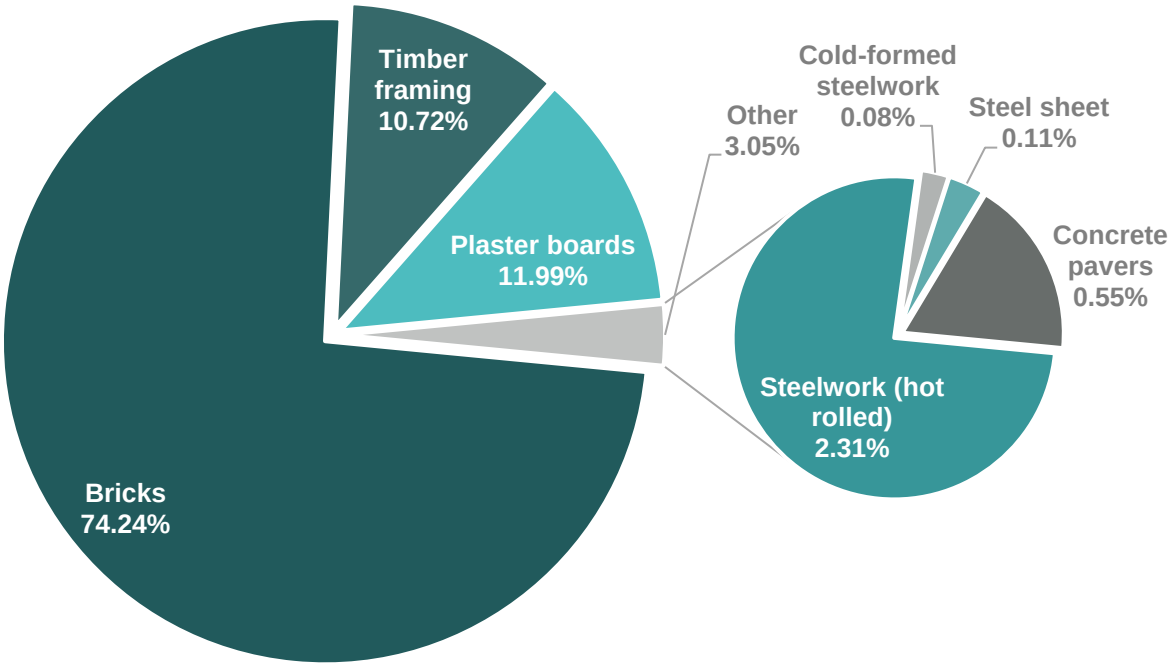

Figure 30 Proposed reusable KDP breakdown by volume (m^3)

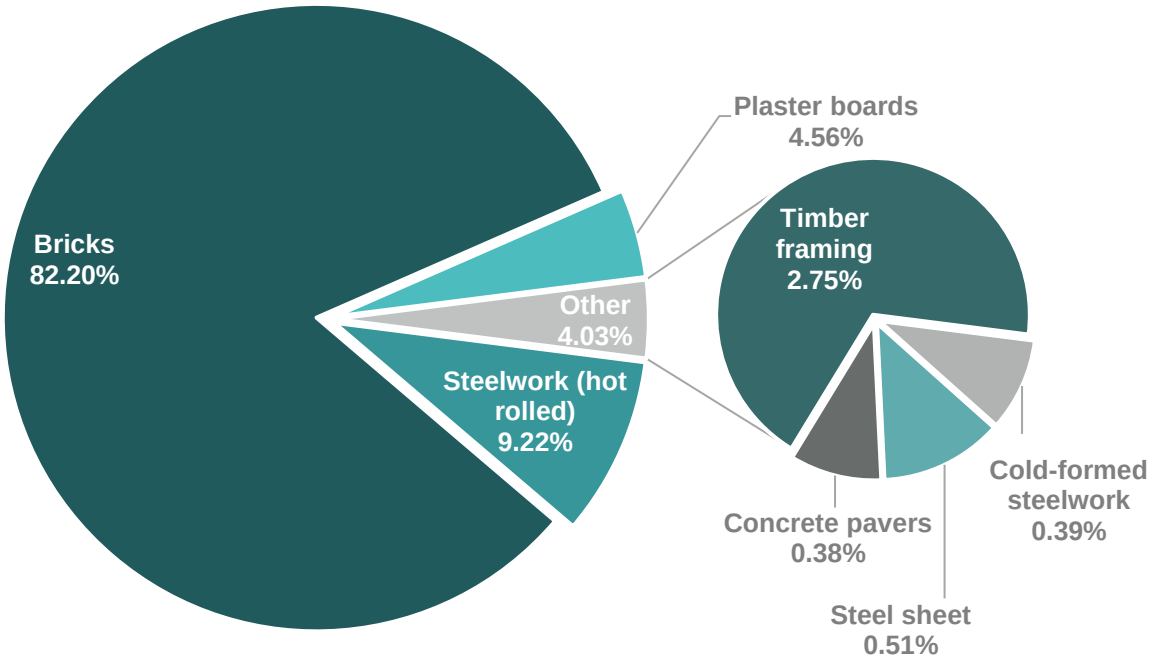

Figure 31 Proposed reusable KDP breakdown by weight (tonnes)

Table 25 Examples of organizations and platforms to maximize the reuse potential of the KDPs

Company name	Website	Brief description
Salvo	https://www.salvoweb.com/	Salvo is the marketplace for architectural antiques, gardens, decorative, salvage and reclaimed building materials.
Reuse Network	https://reuse-network.org.uk	Supports reuse charities across the UK to help them alleviate poverty, reduce waste and tackle climate change
Cleveland Steel & Tubes Ltd.	https://cleveland-steel.com/	Steelwork stockist with interest in promoting the structural steel reuse practice.
Ainscough Metals	https://www.ainscoughmetals.co.uk/	New and used steel suppliers and fabricators.
Supply Chain Sustainability School	https://www.supplychainschool.co.uk	An interactive map showing the different platforms available for a material exchange geographically.
Reyooz	https://www.reyooz.com	Offer a service to collect surplus and distribute to charities, schools and small businesses.
Globechain	https://globechain.com	A reuse marketplace that donates to charities, schools and small businesses
Collecteco	https://www.collecteco.co.uk	Donation of furniture and equipment to charities, schools and small businesses.
Scrapstores	https://www.workandplayscrapstore.org.uk/	Scrapstore repurposes waste and surplus goods as arts and crafts materials
Reuseful UK	https://www.reusefuluk.org/	ReusefulUK is a national network of scrap stores, resources and creative reuse centres
panel sell	https://www.panelsell.co.uk/	Reseller of reclaimed sandwich panels
London Reclaimed Brick Merchants	www.lrbm.com	Reseller of reclaimed bricks
Cladding Warehouse	https://www.claddingwarehouse.co.uk	The platform may be considered to trade cladding or insulation components. Second-hand components are advertised.

6 Guidance to maximize recycling and proposed recycling targets

It is recommended that to maximise the recycling opportunities of the KDPs that the following materials are segregated on-site:

- Concrete
- Metals
- Bricks
- Plasterboards
- Timber
- Plastics
- Insulation
- Bitumen
- Glass
- Ceramics
- Carpet
- Hazardous waste
- WEEE

The project may follow the recycling rates proposed in Table 26. These should be discussed with relevant actors before the demolition/deconstruction works begin.

The estimated percentage of waste materials that can be recycled and diverted from landfill is 91% by volume and 97% by weight. However, it should be possible to reach a figure close to 100% diversion from landfill if the inert waste (concrete, brick, blockwork – almost 85% of the waste likely to be sent to landfill) is all recycled.

Table 26 Proposed recycling rates

KDPs	EWC	Volume (m^3)		Weight (tonnes)		Recycling Rate %	Landfill Volume (m^3)	Landfill Weight (tonnes)
Concrete	17 01 01	2638.46	63.8%	6196.28	73.9%	98%	52.77	123.93
Bricks	17 01 01	612.13	14.8%	1163.05	13.9%	98%	12.24	23.26
Metal	17 04 05 17 04 02	68.63	1.7%	508.88	6.1%	100%	0.00	0.00
Ceramics	17 01 03	79.65	1.9%	176.57	2.1%	98%	1.59	3.53
Plaster products	17 08 02	164.72	4.0%	107.43	1.3%	75%	41.18	26.86
Glass	17 02 02	31.10	0.8%	77.76	0.9%	100%	0.00	0.00
Timber	17 02 01	170.53	4.1%	75.03	0.9%	90%	17.05	7.50
Bitumen	17 02 01	44.52	1.1%	56.02	0.7%	50%	22.26	28.01
Insulation	17 06 04	232.18	5.6%	11.61	0.1%	25%	174.13	8.71
Plastics	17 02 03	66.60	1.6%	9.93	0.1%	50%	33.30	4.96
Carpet	20 01 11	26.40	0.6%	5.28	0.1%	25%	19.80	3.96
Total	-	4134.91	100%	8388	100%	-	**374.33** (~9% of the total KDPs)	**230.72** (~3% of the total KDPs)

During the demolition, details of the materials arisings and the waste management methods used should be recorded to compare actual with forecast and assess performance against the proposed targets. Following the completion of the project, any barriers to achieving the targets should be reviewed to ensure that these barriers can be overcome in future projects.

The information in Table 26 is represented graphically in Figure 32 and Figure 33.

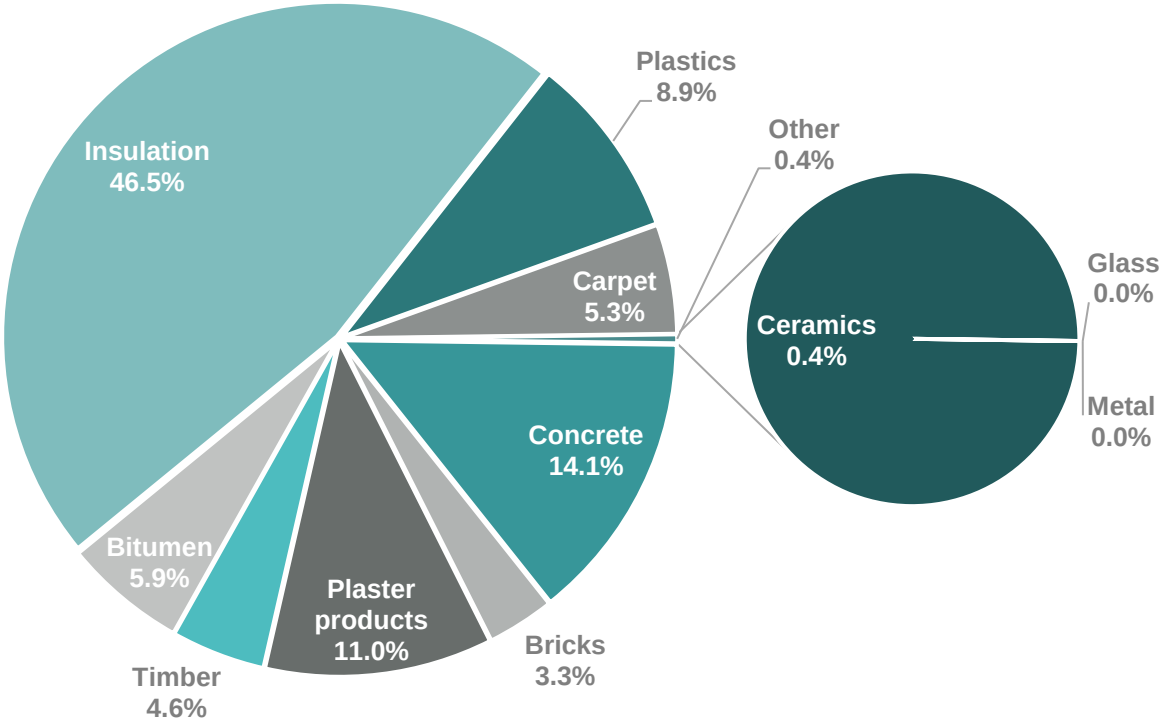

Figure 32 Estimated landfill waste breakdown by volume (m^3)

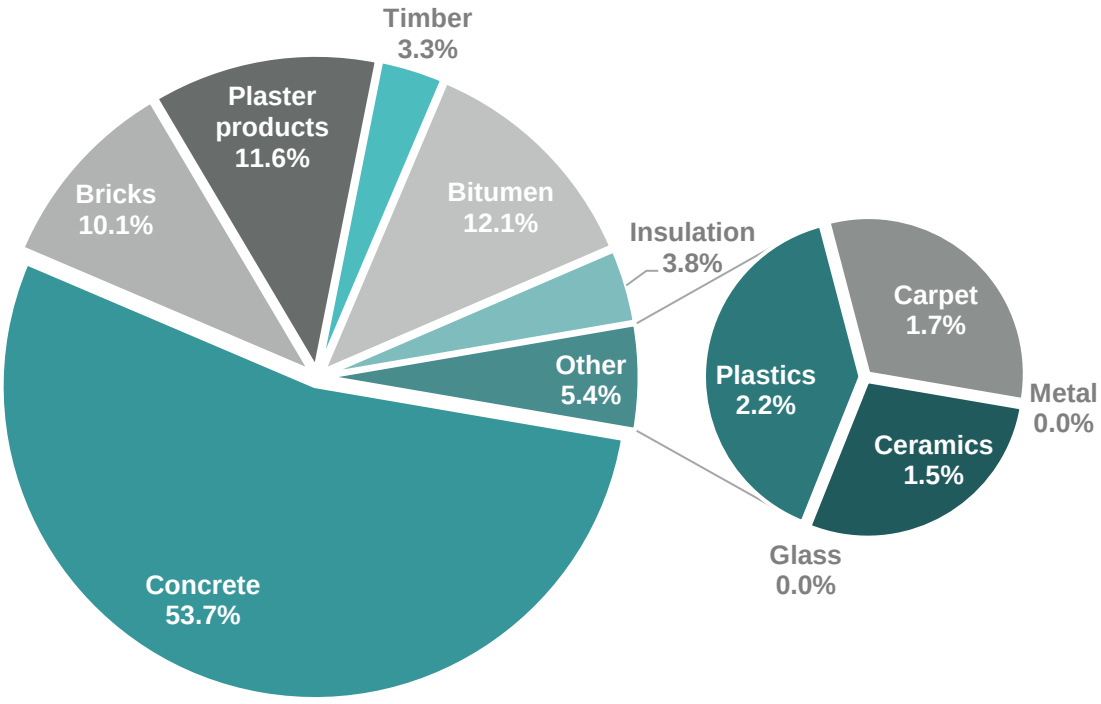

Figure 33 Estimated landfill waste breakdown by weight (tonnes)

100 chalk farm road
london NW1 8EH

100

refurbishment feasibility report
gl hearn

august 2013

one housing group

Refurbishment Feasibility Study

One Housing Group

100 & 100a Chalk Farm Road
London
NW1 8EH

24 July 2013

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Contents

Appendices

Quality Standards Control

The signatories below verify that this document has been prepared in accordance with our quality control requirements. These procedures do not affect the content and views expressed by the originator.

This document must only be treated as a draft unless it is has been signed by the Originators and approved by a Business or Associate Director.

DATE	ORIGINATORS	APPROVED
24/07/2013	Michael Karbownik Senior Building Surveyor	Matthew Still Building Consultancy Director

Limitations

This document has been prepared for the stated objective and should not be used for any other purpose without the prior written authority of GL Hearn; we accept no responsibility or liability for the consequences of this document being used for a purpose other than for which it was commissioned.

EXECUTIVE SUMMARY

We have undertaken a survey of the existing buildings to assess their capability to meet the needs of commercial tenants likely to be attracted to the office accommodation at 100 and 100a Chalk Farm Road, London.

- We have established that the existing buildings fail to meet the requirements of most tenants because of their age, construction, fit-out and various site constraints resulting in buildings that are poorly configured, provide poor levels of thermal comfort and which are largely obsolete.

- We have scored each of the buildings against the relevant factors that determine whether a building performs satisfactorily and measured their performance against industry standard benchmarks. This illustrates that, in their existing format, the buildings cannot attract tenants who are willing to pay market level rents.

- We have prepared outline budget costs for the complete refurbishment of the buildings which would be required to upgrade them to modern standards in order to stand the best chance of letting at market rental levels.

- However, we discovered that even after refurbishment there are significant constraints upon the space, particularly when compared to new build accommodation. This is illustrated within the assessment we have undertaken which indicates that the physical restrictions of the buildings and the site itself, results in space that would remain un-attractive to potential tenants.

- The improvements in the buildings that are achieved through refurbishment come at a considerable cost, the payback period for which would make undertaking the works economically unviable.

- The budget cost of the refurbishment of all the buildings is approximately £3,400,000. This figure is approximately 70% of the cost of a new build option.

1 INTRODUCTION

1.1 This report identifies the existing condition of the buildings at 100 and 100a Chalk Farm Road, which were inspected on 12 July 2013, and outlines the works that will be required to upgrade the structures to meet current Building Regulation requirements, as well as increasing their usability so that they are economically viable.

1.2 We have also been instructed to carry out an investigation into the condition and performance of the existing buildings to establish the likely costs of refurbishing them so that they will appeal to a wide range of potential occupiers.

1.3 One of the buildings on the site provides a purpose built conference facility. The unusual nature of is type of building usage means that accurate benchmarking data is unavailable. Our building analysis has therefore been limited to the purpose built offices, however the site as a whole has been considered within the conclusion.

2 DESCRIPTION OF THE BUILDING FABRIC AND SERVICES

2.1 The site, currently within the leasehold ownership of One Housing Group, consists of 4 interlinked structures:

- A purpose built 5 storey office block known as 100 Chalk Farm Road
- A small purpose built 3 storey office with basement known as 100a Chalk Farm Road;
- A conference hall with ancillary offices and reception;
- A small car park set over 2 storeys.

2.2 <u>100 Chalk Farm Road</u>

2.2.1 100 Chalk Farm Road is a purpose built 5 storey office which we believe to have been constructed in the 1970's using a concrete superstructure and polyester powder coated aluminium cladding with top hung and centre-pivoting double glazed casement windows and fair face brick walls to the ground floor.

2.2.2 The roofs, where visible are of flat construction with bituminous felt coverings and we have assumed that this method of construction is prevalent throughout all the buildings on the site.

2.2.3 The roof rainwater discharges into downpipes within the internal service ducts. The fenestration consists of double glazed aluminium framed units, of which every 4th window is an opening casement.

2.2.4 The current entrance and main reception to 100 Chalk Farm Road is located to the rear of the property and accessed via a stepped ramp from street level. The reception area to the front of the building is no longer in use due to the constraints on disabled access. The main entrance to 100a Chalk Farm Road remains via the stepped street level access.

2.2.5 Internally, a central stairwell and lift core allows vertical access between levels and, a second emergency escape stair core is located to the western side of the building. The internal configuration to office areas is largely open plan with some sub-division providing smaller offices, meeting room space and quiet areas.

2.2.6 Internally, the perimeter walls consist of full height glazing with a boxing at low level housing small power and services and a plasterboard bulkhead above housing the heating and cooling plant and ductwork. The internal walls consist of lightweight demountable partitioning and the ceilings are suspended with lay-in grid mineral fibre tiles. The floors are of concrete screed finished with a mixture of carpet and vinyl coverings.

2.2.7 Artificial lighting is provided by way of fluorescent tube luminaires with louvered diffusers with electrical circuitry run within the ceiling void. Small power is located along the perimeter and is also run vertically from the ceiling to point of use via power poles.

2.2.8 Heating is provided by way of a gas fired boiler, linked to perimeter 'Versatemp' units ducted throughout the offices. Cooling is provided by main roof and ancillary air-conditioning units which also feed into the perimeter ducting.

2.3 <u>100a Chalk Farm Road</u>

2.3.1 100a Chalk Farm is a purpose built 3 storey office with basement constructed in the 1970s using a concrete superstructure and polyester powder coated aluminium cladding with double glazed windows and fair face brick walls at ground floor level.

2.3.2 The roof is of assumed flat construction with a bituminous felt covering. The roof rainwater discharges on to the roof of conference hall via downpipes attached to brick flank of building.

2.3.3 The fenestration consists of double glazed windows set in aluminium frames with single glazed Georgian wire units forming the basement windows.

2.3.4 Internally, the building's vertical access is via the stair core to the north-western corner which also houses WC's at ground floor level. Individual floors are sub-divided into a number of smaller perimeter offices accessed from a central area.

2.3.5 The ceilings are suspended with lay-in grid mineral fibre tiles and integrated fluorescent luminaires in louvered diffuser housings. The floors are solid concrete with a carpet covering to the office and circulation space with vinyl tiles to the WC's.

2.3.6 Heating is provided by way of a gas fired boiler, linked to high level perimeter 'Versatemp' units to the offices. Cooling is provided by an ad hoc arrangement of dedicated DX-type comfort cooling units.

3 CONDITION

3.1 Roofs

3.1.1 Inspection to roof areas was limited to the conference hall where the condition of the bituminous felt covering is in reasonable condition although poor detailing is evident to the parapet walls and rooflight upstands increasing the risk of splits and potential water ingress internally.

3.2 Structures

3.2.1 Structurally all the buildings on the site appear to be sound and throughout our inspection of the visible sections of the elevation walls and floor structures, we did not note any significant defects or any items of significant disrepair that would indicate they were under stress or had been poorly designed.

3.2.2 Within the basement plant roof to 100 Chalk Farm Road we were able to view the exposed ceiling soffit which consists of hollow clay pots providing a permanent formwork on to which in-situ concrete is poured. This was a popular method of construction during the 1960's and 1970's although quality control on individual builds could be variable and voiding or 'honeycombing' can be hidden by clay spacer tiles between the pots could reduce fire protection and strength. However, we did not note anything to suggest that this may be the case here.

3.3 Walls

3.3.1 The walls forming the external envelopes of the site buildings are in a fair condition, although redundant penetration holes and low level spalling was noted to multiple areas of ground floor masonry. The precast concrete window surrounds are heavily stained and lower levels have sustained small areas of spalling. There is extensive graffiti to various elevations throughout.

3.4 Windows and Cladding

3.4.1 The fenestration is generally in a poor condition. The internal seals have become dislodged, significantly impacting airtightness. Impact and water damage was noted to a number of areas. The age of the windows means it is unlikely that they were manufactured with an integrated thermal break and in comparison to modern standards, the windows perform poorly in terms of thermal and acoustic insulation.

3.4.2 The polyester powder coated cladding system is in fair condition although heavily soiled. Surface contaminants cause aluminium cladding to become discoloured and develop pitting on the surface, resulting in long term corrosion. Peeling and corrosion was evident to the finishes in numerous areas and the mastic seals to the panel joints are degrading and becoming brittle.

3.5 Internal Finishes

3.5.1 Internally the offices have been fitted out to the occupier's requirements. The finishes are basic and tired and would benefit from a general refresh although the condition of the reception to the main building is much newer and in better order.

3.6 Services

3.6.1 The services were not tested but from a visual inspection appeared to be dated and some are obsolete. The boiler is coming to the end of its useful life and is likely to require increasing on-going maintenance and financial expenditure to remain operational. A large air chiller located in the car park has the potential to pose a significant legionella risk which provides an on-going maintenance liability.

4 BUDGET COSTS

4.1 Budget costs were prepared following liaison with Asset Plus One Limited and local agents with expertise of the Camden market. Therefore, the scope of works identified is one which would be required in order to meet the standards demanded by occupiers within the locality and which would be capable of achieving a market level rental income.

4.2 The fully itemised budget cost breakdown is at Appendix 1 but in summary, the total cost of refurbishing the buildings is estimated at £3,400,000. This consists of £2,045,000 for the refurbishment of 100 Chalk Farm Road and £709,000 for the accommodation at 100a Chalk Farm Road.

5 EXISTING BUILDING ANALYSIS

5.1 The existing buildings were originally constructed in the 1970s to provide office accommodation. The two buildings office buildings on site, known as 100 and 100a Chalk Farm Road comprise approximately 2840m2 (NIA) of space.

5.2 One Housing Group occupy the space at 100 whilst 100a is currently tenanted.

5.3 The rental levels achieved over the past decade have been poor, as the buildings do not lend themselves to the requirements of the majority of commercial tenants. Additionally, there is currently little demand for office space of this type in the Chalk Farm area which is not a primary commercial location, resulting in imperfect low density occupation and accordingly, low rent yields if the space is let.

5.4 In order to assess the performance of the existing buildings we have produced the methodology within the following section of this report to quantify the performance against various key benchmarking criteria.

6 REFURBISHMENT

6.1 It is evident from the condition and poor demand for the space along with the current maximum achievable rental levels that the existing buildings fail to meet the requirements of their current and future occupants.

6.2 Therefore, we have prepared an outline refurbishment scheme to model how the buildings would perform if they were brought up to current standards.

6.3 The notional refurbishment has retained the existing structure but in order to meet modern Building Regulation standards we have allowed for the services to be completely renewed and externally, for the roofs, windows and cladding to be replaced and for thermal insulation levels to be increased wherever possible.

7 METHODOLOGY

7.1 In undertaking our assessment of the feasibility of the refurbishment option we have consulted various published guidance.

7.2 The British Council for Offices Design Guide is accepted as the industry standard for the specification of offices and is recognised in the market as representing good practice in the procurement of commercial office workspace.

7.3 The BREEAM Assessment Tool is a standard approach that is regularly used to assess the sustainability of commercial buildings. It assess the sustainability of buildings, rating their location as well as construction details.

7.4 For the purposes of this assessment we have appended BCO and BREEAM criteria that measure the performance of the buildings from both a usability and sustainability point of view.

7.5 We have listed out below the criteria that are used within the scoring matrix at Appendix 2. We have described the desired criteria, and within the suitability assessment we indicate whether a building has met or failed to meet the standard.

7.6 Some of the criteria are more significant to the overall performance of commercial buildings than others and we have therefore applied weightings to each of them.

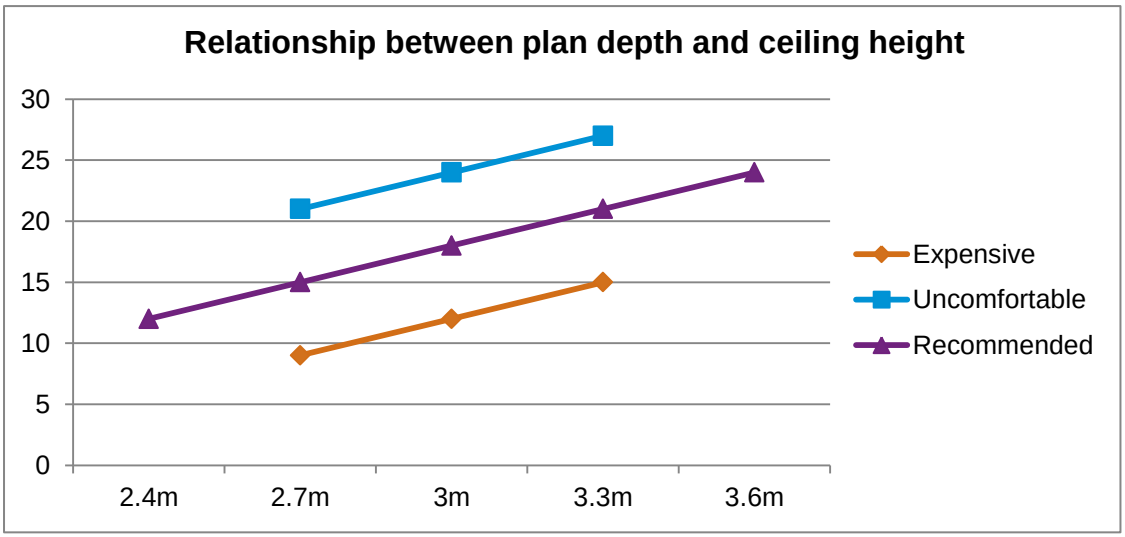
8 BENCHMARKING CRITERIA FOR OFFICES

8.1 Plan Depth and Ceiling Height

8.1.1 Window to window or atrium 13.5m – 21m

8.1.2 Finished floor to underside of ceiling 2.6m – 3.3m

8.1.3 The relationship between plan depth and ceiling height is critical. Natural light and ventilation is available to occupiers of perimeter space in a zone approximately 5m to 7.5m wide or 2 to 2.5 times the floor to ceiling height of the room. Comfort conditions that are not within this zone have to be maintained using artificial light and ventilation with resulting effects on energy consumption.



8.1.4 The subject office buildings do not perform well in this regard, low floor to ceiling heights are below good design practice levels and obviate adequate plan depth. The low ceiling height would not allow the inclusion of industry standard raised deck floors to any refurbishment, which would serve to reduce the floor to ceiling height further, resulting in space that feels cramped and claustrophobic.

8.2 Floor Plate Efficiency

8.2.1 Ratio of Net Internal Area (NIA) to Gross Internal Area (GIA): 80-85%

8.2.2 In general, smaller plates are less efficient because the core elements become disproportionately large as the plate size is decreased. Floor plates of less than 750 sq m are relatively inefficient.

8.2.3 The floor plate areas of the subject buildings are considerably below recommended areas at approximately 507m2 and 230m2. Floor plate efficiency for 100 Chalk Farm Road is unsatisfactory at 80%, whilst due to its limited storey height and thus disproportionally large core - 100a Chalk Farm Road is worse at 75% against the benchmark measure.

8.2.4 This inefficiency to the main building is detrimental to the rental levels that can be achieved as a smaller portion of the space is lettable than would be the case with more efficient floor plate. This in turn has a negative impact on the financial viability of any refurbishment as it increases the length of the payback period.

8.3 Core Elements

8.3.1 Cores should be positioned to serve the largest possible floor area and to facilitate the sub-division of floor plates.

8.3.2 Escape stairs should be designed to accommodate the maximum anticipated occupancy of the building. Whilst the stairs within the subject buildings are all adequate, with increased occupancy levels this may require review.

8.3.3 Standards for WC provision are set out in BS 6465 Part 1 1994. The requirement is based on occupancy and is therefore only indirectly related to floor area. A population of one person per 14 sq m is used for calculation. At least one WC cubicle in separate sex toilet accommodation should be suitable for ambulant disabled people. It should be noted that the historic occupancy assumption of one person per 14 sq m for offices is out-dated; soon to be released guidelines are likely to reflect an increasing trend of one person per 10.

8.3.4 The capacity for WC provision appears to be adequate, although this is largely due to the under occupation of the building and poor use of space; the limited area within the core leaves provisions cramped and poorly arranged. It would not be easily possible to increase the space allocated to

toilet provisions, any additional provision would decrease lettable space adversely affecting financial viability.

8.4 Structural Loadings

8.4.1 Floors should be constructed to achieve loadings of 2.5 kN/ over approximately 95% of each potentially sub-lettable area. Floors with increased live loading capabilities of 3 kN/ increase the flexibility of the building to accommodate changes in space planning and in particular the layout of circulation aisles and corridors.

8.4.2 It would be necessary to engage the services of a structural engineer to assess the floor loading capacities for both buildings before the structure can be deemed adequate for any proposed refurbishment scheme.

8.5 Thermal Considerations

8.5.1 Good building design should ensure acceptable levels of thermal comfort and the control of condensation. In the existing buildings, the aluminium framed windows allow cold bridging and the degraded adhesive to the seals permit high levels of uncontrolled air leakages. This can result in significant temperature variances and inefficiency as the performance of the air conditioning is undermined. Large areas with low surface temperatures can cause discomfort by radiant cooling or by creating down-drafts.

8.5.2 Naturally ventilated spaces should not overheat when subjected to moderate levels of internal heat gain. Spaces that incorporate mechanical ventilation or cooling should not require excessive cooling plant capacity to maintain desired space conditions. Due to high glazing ratios and low ceiling heights, excessive solar gains were noted to both buildings. Unsatisfactory mitigation measures have included the installation of portable air circulation fans in an attempt increase comfort levels.

8.5.3 Whilst the existing buildings benefit from openable windows for natural ventilation, the low ceiling heights and central core prevent adequate cross ventilation levels. Opening windows is not a viable method for achieving ventilation due to high levels of external noise and air pollution. Any proposed refurbishment scheme that would allow acceptable methods of natural ventilation would require overhauling of façade with inclusion of controllable ventilation panels and ducting.

8.6 Access to and use of Buildings

8.6.1 Much of the guidance in Approved Document M is found in the British Standard 8300:2001 Code of Practice. Parking bays for disabled users should be provided with dimensions of 3.6m x 6m. The Code of Practice provides limits on the number and dimensions of risers to external stepped access. Similarly, there are additional limits to internal stairs on the size of landings and the requirement for continuous handrails on both sides of flights and landings.

8.6.2 The existing site does not facilitate good access to and use of the buildings in accordance with the requirements of current legislation and good practice. The benefit of an assisted access entrance door to the main building is undermined by the long, winding and stepped external access ramp. Lift access provisions comply with minimum requirements although these are considerably below those expected by both the BCO guidelines and DDA legislation. There is no step free access to 100a Chalk Farm Road.

8.6.3 A refurbishment would not be able to address vertical access issues to the main building as the restriction of the concrete superstructure does not permit the inclusion of a larger lift shaft. An external chair lift at street level would allow access to the ground floor of the main building although this would not be a perfect solution as it would not satisfy the current access arrangement which is to the rear.

8.6.4 100a Chalk Farm Road is worse as access to the front elevation main entrance would require a lift. Access to the rear would be possible but would require amendments to the sloping access ramp which is currently used for vehicular access only.

8.6.5 Due to the physical building and site constraints the necessary works to achieve compliance with the requirements of the Equality Act would be unreasonably expensive and prohibitive.

9 CONCLUSION

9.1 The existing buildings are structurally in satisfactory condition, but many of the elements are coming to the end of their economic life, including the heating and cooling systems and fenestration.

9.2 The Building Suitability Assessment at Appendix 2 indicates that the existing buildings score very poorly when rated against the best in class standards for commercial property:

- 100 Chalk Farm Road: 46.6%
- 100a Chalk Farm Road: 45.4%

9.3 The buildings may be refurbished and reconfigured, which will substantially improve their performance. The Building Suitability Assessment indicates that following the refurbishment the buildings would be likely to score as follows:

- 100 Chalk Farm Road: 78.9%
- 100a Chalk Farm Road: 77.1%

9.4 However, achieving these improvements comes at a considerable cost which is likely to be approximately £3,400,000. This is approximately 70% of the cost of a new build redevelopment option.

9.5 In summary, the buildings as they stand are obsolete and do not achieve rental levels that make them viable as an on-going concern. They can be substantially improved through refurbishment, but this, due to the physical constraints of the site and the buildings themselves, will still result in buildings that are unattractive in a difficult market with low demand and competing stock availability. In light of the payback period and rental levels achievable even after refurbishment, this would not be a financially viable option.

APPENDIX A

BUDGET COSTS

ELEMENTAL COST PLAN FOR REFURBISHMENT OF 100 AND 100A CHALK FARM ROAD, LONDON

GL Hearn

1.00 Generally

1.01 These budget costings have been prepared with the intention of providing high level budget estimates for the costs which would be incurred in undertaking a full refurbishment of the buildings to provide the standard of accommodation that the market demands in order to re-let.

1.02 In preparing these budget estimates have relied on the Net Internal Floor Areas quoted in the summary report derived from CAD drawings by XYZ Land Surveys Drg. Nrs. 2013/027/02, 03, 04, 05, 06, 07 & 08. For reference these are reproduced below at item 1.08.

1.03 These costs reflect current day prices and no allowance has been included for inflation to the start on site date.

1.04 No allowance has been made for asbestos removal.

1.05 We have not allowed for any sustainability measures such as PV panels as this would be subject to Building Control Part L2B requirements which cannot be ascertained at this stage.

1.06 A site visit has was undertaken on 12 July 2013.

1.07 Refer to Appendix A for further pricing notes.

1.08 Schedule of Accommodation:

Building	Floor	NIA (m2)
100 Chalk Farm Road	Basement	0
100 Chalk Farm Road	Ground	444.46
100 Chalk Farm Road	First	406.03
100 Chalk Farm Road	Second	406.2
100 Chalk Farm Road	Third	405.04
100 Chalk Farm Road	Fourth	405.43
100a Chalk Farm Road	Basement	202.35
100a Chalk Farm Road	Ground	330.5
100a Chalk Farm Road	First	240.4
Total		**2840.41**

ELEMENTAL COST PLAN FOR REFURBISHMENT OF 100 AND 100A CHALK FARM ROAD, LONDON

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Item		Qty	Unit	Rate	Total £	Comments
1.00	**Refurbishment works to 100 Chalk Farm Road**					
1.01	**Strip out and preparatory works**					
	Allowance for soft strip.	2,067	m2	15.00	31,005	
	Cladding and window removal.	1,380	m2	35.00	48,300	
	Structural alterations to facilitate new cladding, fenestration and services.	1,500	m2	35.00	52,500	
	Sub-total			**£**	**131,805**	
1.02	**Roof**					
	Strip off and replace roof with new including upgrading insulation.	390	m2	200.00	78,000	
	Sub-total			**£**	**78,000**	
1.03	**Cladding and Windows**					
	New insulated panel cladding system.	690	m2	400.00	276,000	
	New glazing, alumium sealed double glazed units.	690	m2	450.00	310,500	
	Solar shading.	1	Nr	35,000.00	35,000	
	Sub-total			**£**	**586,500**	
1.04	**Internal Walls and Doors**					
	Internal plasterboard walls.	1,080	m2	55.00	59,400	
	Skirtings.	750	m	8.00	6,000	
	Internal doors	56	Nr	800.00	44,800	
	Plasterboard lining to inner face of external walls.	920	m2	35.00	32,200	
	Painting.	2,000	m2	8.00	16,000	
	Total to Summary			**£**	**110,200**	

Item		Qty	Unit	Rate	Total £	Comments
1.05	**Floor Finishes**					
	Dust sealer to top of slab/screed.	2,067	m2	2.00	4,134	
	New carpet.	2,067	m2	35.00	72,345	
	New vinyl.	100	m2	45.00	4,500	
	Total to Summary			**£**	**80,979**	
1.06	**Ceilings**					
	New mineral fibre tiles to retained lay-in grid suspended ceiling throughout.	2,067	m2	15.00	31,005	
	Total to Summary			**£**	**31,005**	
1.07	**Fixtures and Fittings**					
	Kitchenette fit-out.	5	Nr	5,000.00	25,000	
	Allowance for general joinery and fittings.	1	Nr	10,000.00	10,000	
	Total to Summary			**£**	**35,000**	
1.08	**Sanitary Fittings/Disposal Installations**					
	Toilet core fit-out.	10	Nr	6,000.00	60,000	
	Total to Summary			**£**	**60,000**	
1.09	**Space Heating / Ventilation**					
	Gas fired boilers.	2,067	m2	13.00	26,871	
	LTHW installation, distribution and radiators.	2,067	m2	85.00	175,695	
	Dedicated VRV cooling system	2,067	m2	50.00	103,350	
	Ventilation, AHU's, plant and ductwork.	2,067	m2	25.00	51,675	
	Total to Summary			**£**	**357,591**	

Item		Qty	Unit	Rate	Total £	Comments
1.10	**Electrical Installation**					
	LV switchgear and distribution boards.	600	m2	32.00	19,200	
	Small power.	600	m2	95.00	57,000	
	Office lighting inc. emergency lights.	2,067	m2	75.00	155,025	
	Total to Summary			**£**	**231,225**	
1.11	**Protective and Comms installations**					
	Fire and smoke detection and alarm system, security installation.	2,067	m2	40.00	82,680	
	Disabled refuge alarm, disabled wc alarm, induction loop.	2,067	m2	5.00	10,335	
	Total to Summary			**£**	**93,015**	
1.12	**Special installations**					
	BMS	2,067	m2	25.00	51,675	
	Lifts	2	Nr	40,000.00	80,000	
	Total to Summary			**£**	**131,675**	
1.13	**Builders Work**					
	Forming holes and chases; fire stopping and sundries etc.	1	Nr	20,000.00	20,000	
	Total to Summary			**£**	**20,000**	
1.14	**External Work**					
	Re-surface car park top deck	150	m2	75.00	11,250	
	Repair spalled parapet wall brickwork	35	lm	35.00	1,225	
	Remove stepped entrance to create ramped access	32	m2	60.00	1,920	

ELEMENTAL COST PLAN FOR REFURBISHMENT OF 100 AND 100A CHALK FARM ROAD, LONDON

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Item		Qty	Unit	Rate	Total £	Comments
	Overhaul secondary entrance and link area complete including reception, offices and WC's.	240	m2	350.00	84,000	
	Total to Summary			**£**	**98,395**	
	SUMMARY					
1.01	Strip out and Preparatory Works			£	131,805	
1.02	Roof			£	78,000	
1.03	Cladding and Windows			£	586,500	
1.04	Internal Walls and Doors			£	110,200	
1.05	Floor Finishes			£	80,979	
1.06	Ceilings			£	31,005	
1.07	Fixtures and Fittings			£	35,000	
1.08	Sanitary Fittings/Disposal Installations			£	60,000	
1.09	Space Heating /Ventilation			£	357,591	
1.10	Electrical Installation			£	231,225	
1.11	Protective & Comms Installations			£	93,015	
1.12	Special Installations			£	131,675	
1.13	Builders Work			£	20,000	
1.14	External Work			£	98,395	
	TOTAL TO MAIN SUMMARY			**£**	**2,045,390**	

ELEMENTAL COST PLAN FOR REFURBISHMENT OF 100 AND 100A CHALK FARM ROAD, LONDON

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Item		Qty	Unit	Rate	Total £	Comments
2.00	**Refurbishment works to 100a Chalk Farm Road**					
2.01	**Strip out and preparatory works**					
	Allowance for soft strip.	773	m2	15.00	11,595	
	Cladding and window removal.	350	m2	35.00	12,250	
	Structural alterations to facilitate new cladding, fenestration and services.	500	m2	35.00	17,500	
	Sub-total			**£**	**41,345**	
2.02	**Roof**					
	Strip off and replace roofs with new including upgrading insulation.	252	m2	200.00	50,400	
	Sub-total			**£**	**50,400**	
2.03	**Cladding and Windows**					
	New insulated panel cladding system.	175	m2	400.00	70,000	
	New glazing, alumium sealed double glazed units.	175	m2	450.00	78,750	
	Solar shading	1	Nr	25,000.00	25,000	
	Sub-total			**£**	**148,750**	
2.04	**Internal Walls and Doors**					
	Internal plasterboard walls.	200	m2	55.00	11,000	
	Skirtings.	100	m	8.00	800	
	Internal doors	12	Nr	800.00	9,600	
	Plasterboard lining to inner face of external walls.	270	m2	35.00	9,450	
	Painting.	470	m2	8.00	3,760	
	Total to Summary			**£**	**21,400**	

ELEMENTAL COST PLAN FOR REFURBISHMENT OF 100 AND 100A CHALK FARM ROAD, LONDON

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Item		Qty	Unit	Rate	Total £	Comments
2.05	**Floor Finishes**					
	Dust sealer to top of slab/screed.	773	m2	2.00	1,546	
	New carpet.	773	m2	35.00	27,055	
	New vinyl.	45	m2	45.00	2,025	
	Total to Summary			**£**	**30,626**	
2.06	**Ceilings**					
	New mineral fibre tiles to retained lay-in grid suspended ceiling throughout.	773	m2	15.00	11,595	
	Total to Summary			**£**	**11,595**	
2.07	**Fixtures and Fittings**					
	Kitchenette fit-out.	3	Nr	5,000.00	15,000	
	Allowance for general joinery and fittings.	1	Nr	5,000.00	5,000	
	Total to Summary			**£**	**20,000**	
2.08	**Sanitary Fittings/Disposal Installations**					
	Toilet core fit-out.	6	Nr	6,000.00	36,000	
	Total to Summary			**£**	**36,000**	
2.09	**Space Heating / Ventilation**					
	Gas fired boilers.	773	m2	13.00	10,049	
	LTHW installation, distribution and radiators.	773	m2	85.00	65,705	
	Didicated VRV cooling system	773	m2	50.00	38,650	
	Ventilation, AHU's, plant and ductwork.	773	m2	25.00	19,325	
	Total to Summary			**£**	**133,729**	

Item		Qty	Unit	Rate	Total £	Comments
2.10	**Electrical Installation**					
	LV switchgear and distribution boards.	225	m2	32.00	7,200	
	Small power.	225	m	95.00	21,375	
	Office lighting inc. emergency lights.	773	m2	75.00	57,975	
	Total to Summary			**£**	**86,550**	
2.11	**Protective and Comms installations**					
	Fire and smoke detection and alarm system, security installation.	773	m2	40.00	30,920	
	Disabled refuge alarm, disabled wc alarm, induction loop.	773	m2	5.00	3,865	
	Total to Summary			**£**	**34,785**	
2.12	**Special installations**					
	BMS	773	m2	25.00	19,325	
	Install lift.	1	Nr	60,000.00	60,000	
	Total to Summary			**£**	**79,325**	
2.13	**Builders Work**					
	Forming holes and chases; fire stopping and sundries etc.	1	Nr	7,500.00	7,500	
	Total to Summary			**£**	**7,500**	
2.14	**External Work**					
	Remove existing DX condensers.	20	Nr	350.00	7,000	
	Total to Summary			**£**	**7,000**	

ELEMENTAL COST PLAN FOR REFURBISHMENT OF 100 AND 100A CHALK FARM ROAD, LONDON

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Item		Qty	Unit	Rate	Total £	Comments
	SUMMARY					
2.01	Strip out and Preparatory Works			£	41,345	
2.02	Roof			£	50,400	
2.03	Cladding and Windows			£	148,750	
2.04	Internal Walls and Doors			£	21,400	
2.05	Floor Finishes			£	30,626	
2.06	Ceilings			£	11,595	
2.07	Fixtures and Fittings			£	20,000	
2.08	Sanitary Fittings/Disposal Installations			£	36,000	
2.09	Space Heating /Ventilation			£	133,729	
2.10	Electrical Installation			£	86,550	
2.11	Protective & Comms Installations			£	34,785	
2.12	Special Installations			£	79,325	
2.13	Builders Work			£	7,500	
2.14	External Work			£	7,000	
	TOTAL TO MAIN SUMMARY			**£**	**709,005**	

ELEMENTAL COST PLAN FOR REFURBISHMENT OF 100 AND 100A CHALK FARM ROAD, LONDON

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Item		Qty	Unit	Rate	Total £	Comments
3.00	**MAIN SUMMARY**					
3.01	100 Chalk Farm Road				2,045,390	
3.02	100a Chalk Farm Road				709,005	
3.03	Preliminaries and OHP's @ 12%				330,527	
3.04	**SUB TOTAL**			**£**	**3,084,922**	
3.05	Professional fees @ 6%				185,095	
3.06	Contingency @ 5%				154,246	
3.07	**TOTAL BUDGET COST**			**£**	**3,424,264**	

APPENDIX A - NOTES / ASSUMPTIONS / EXCLUSIONS

1.00 VAT - excluded.

2.00 Increased costs beyond third quarter 2013 - excluded.

3.00 Land acquisition or associated costs - excluded.

4.00 Fibre optic cable diversions - excluded.

5.00 Other exclusions noted in the main body of the cost report.

6.00 No allowance has been made for asbestos removal.

7.00 Costings are based upon the information currently made available to GLH.

8.00 No Structural or Building surveys have been made available and at this stage it is assumed that the structure is sound and capable of taking the required floor loadings.

9.00 No sprinklers have been allowed subject to design input and confirmation.

10.00 Assumed no HAC (High Alumina Cement) within the building.

11.00 Our costs are based on approximate quantities estimated from the visual inspection we carried out on the day of our inspection and are not based on detailed measurements.

12.00 The costs have not been corroborated by tenders from the marketplace and it should be noted that market conditions and tender factors are likely to produce figures which might differ from those given.

APPENDIX B

BUILDING SUITABILITY ASSESSMENTS

			100 Chalk Farm Road								100a Chalk Farm Road							
Element	Source	Benchmark measure	Existing building	Score (0-5)	**Weighted score**	Weighting	Refurbished building	Score (0-5)	**Weighted score**	Weighting	Existing building	Score (0-5)	**Weighted score**	Weighting	Refurbished building	Score (0-5)	**Weighted score**	Weighting
Floor to ceiling height	BCO	2.6m - 3.3m	Poor at 2.4m (with inadequate 0.2m void).	1	**1.6**	8	Cannot be improved unless suspended ceiling is removed which would not be acceptable to occupiers.	1	**1.6**	8	Poor at 2.4m (with satisfactory 0.4m void).	2	**3.2**	8	Cannot be improved unless suspended ceiling is removed which would not be acceptable to occupiers. Existing void is required for buildign servcies.	1	**1.6**	8
Floor plate depth	BCO	13.5m - 21m	Satisfactory - 15.5m.	4	**4.8**	6	No improvement possible as restricted by building structure.	4	**4.8**	6	Satisfactory - 14.5m.	3.5	**4.2**	6	No improvement possible as restricted by building structure.	3.5	**4.2**	6
Structural Loading	BCO	3.5Kn/m²	Unknown, but assumed satisfactory due to concrete superstructure although use of hollow clay pots can conceal voiding and likely to require further investigation.	5	**5.0**	5	Will remain the same and should be able to handle increased loads without any strengthening.	4.5	**4.5**	5	Unknown, but likely to meet requirements.	5	**5.0**	5	Will remain the same and should be able to handle increased loads without any strengthening.	4.5	**4.5**	5
Fresh Air	CIBSE	8 litres per second per person	30% of the windows are openable, however the floor plate depth is over the recommended calculation of floor to window height x 5 for the effective natural ventilation zone.	3	**4.8**	8	Minimum levels of fresh air should be provided through refurbishment although greater heat gains through increased occupancy may require supplemental cooling increasing building energy consumption and C02 emissions.	5	**8.0**	8	30% of the windows are openable, however the floor plate depth is over the recommended calculation of floor to window height x 5 for the effective natural ventilation zone. Of particular concern is the lower ground floor which has very small windows.	2.5	**4.0**	8	Minimum levels of fresh air should be provided through refurbishment although greater heat gains through increased occupancy may require supplemental cooling increasing building energy consumption and C02 emissions.	5	**8.0**	8
Means of Escape in case of Fire	Building Regulations	Approved Document B compliance. Travel distances must not exceed either 18m in one direction and 45m in more than one direction.	Meets statutory requirements although vertical exit leads to confined car park.	4	**6.4**	8	Will remain the same.	4	**6.4**	8	Meets statutory requirements.	4	**6.4**	8	Will remain the same.	4	**6.4**	8
Disabled access	Building Regulations	Approved Document M compliance.	No step free access so although automatic door provided, could not be reached by non-ambulant disabled building users. Lift does not meet dimensions required for wheelchair use, lift car interior does not meet requirements.	1	**1.6**	8	Issues could be addressed however, installation of larger lift would be prohibitively expensive.	5	**8.0**	8	No step free access and no disabled WC provision. Circulation space confined.	1	**1.6**	8	Majority of issues will be addressed. However, access will require ramps so is not an ideal solution. Increase in circulation space would result in reduction of lettable space further reducing financial viability of refurbishment.	4	**6.4**	8
Floor plate efficiency	BCO	Planning grid should be 1.2m x 1.2m - 1.5m x 1.5m.	Good - 3m x 3m with no intermediate columns resulting in relatively efficient and flexible floor plate.	5	**8.0**	8	Remains the same as refurbishment will be within the confines of the existing building footprint.	5	**8.0**	8	Poor 3.3m x 2.9m.	3	**4.8**	8	Remains the same as refurbishment will be within the confines of the existing building footprint.	3	**4.8**	8
Net/ Gross ratio	BCO	85%+	Poor - 80.%	2	**3.2**	8	Will not be improved by refurbishment and will remain either at or below 80%.	1	**1.6**	8	Very poor - 75.%	1	**1.6**	8	Likely to remain the same or get worse if refurbished as core may need to increase to accommodate lift and disbaled WC provision.	4	**6.4**	8
Toilet provision	Building Regulations	Based on occupancy. Assumption one person per 14m² used for calculation.	Satisfactory capacity although layout constricted. Unsatisfactory arrangement with alternating male/female provision to each floor.	2.5	**3.0**	6	Refurbishment will improve although will be expensive to achieve and will be at the expense fo lettable floor space reducing finincial viability.	5	**6.0**	6	Currently satisfactory capacity although building usage not optimal and layout constricted.	3.5	**4.2**	6	Refurbishment will improve although will be expensive to achieve and will be at the expense fo lettable floor space reducing finincial viability.	5	**6.0**	6
Sustainability																		
Day lighting	BREEAM	80% of floor area should receive adequate daylight	Not met, approximately 69% of area achieves level required.	1	**1.0**	5	Will remain the same, refurbishment cannot change fundamental physical constraints of the building.	1	**1.0**	5	Not met, approximately 65% of area achieves level required. Light levels to lower ground floor significantly lower due to small windows and reduced visible sky.	1	**1.0**	5	Will remain the same, refurbishment cannot change fundamental physical constraints of the building.	1	**1.0**	5
Natural ventilation	BREEAM	Fresh air should be provided through natural ventilation with user control of levels	No natural ventilation strategy; limited number of openable windows and in conflict with air conditioning system. Due to high noise and pollution levels, full natural ventilation not viable.	1	**1.0**	5	Will be met by refurbishment of the space and installation of controllable tempered fresh air system providing natural ventilation throughout.	5	**5.0**	5	No natural ventilation strategy; limited number of openable windows and in conflict with air conditioning system. Due to high noise and pollution levels, full natural ventilation not viable.	1	**1.0**	5	Will be met by refurbishment of the space and installation of controllable tempered fresh air system providing natural ventilation throughout.	5	**5.0**	5
Noise attenuation	BREEAM	Sources of noise should not disturb occupants	Busy main road to front elevation and goods train railway line to rear coupled with dated windows offer low levels of sound insulation.	1	**1.2**	6	Refurbishment will meet current Building Regulations requirements.	5	**6.0**	6	Busy main road to front elevation and goods train railway line to rear coupled with dated windows offer low levels of sound insulation.	1	**1.2**	6	Refurbishment will meet current Building Regulations requirements although physical proximity to railway line will mean less than optimal results.	4	**4.8**	6

			100 Chalk Farm Road								100a Chalk Farm Road							
Element	Source	Benchmark measure	Existing building	Score (0-5)	**Weighted score**	Weighting	Refurbished building	Score (0-5)	**Weighted score**	Weighting	Existing building	Score (0-5)	**Weighted score**	Weighting	Refurbished building	Score (0-5)	**Weighted score**	Weighting
Thermal comfort	BREEAM	Defined zoning and user control	Perimeter cooling and heating inadequate for glazing ratios. Singificant heat gain during summer. Inappropriate user controls result in simultaneous operation of heating and cooling drastically reducing efficiency.	1	**1.6**	8	Will be improved through refurbishment but will require complete replacement of services.	5	**8.0**	8	Perimeter cooling and heating inadequate for glazing ratios. Singificant heat gain during summer. Inappropriate user controls result in simultaneous operation of heating and cooling drastically reducing efficiency.	1	**1.6**	8	Will be improved through refurbishment but will require complete replacement of services.	5	**8.0**	8
Acoustic performance	BREEAM	Appropriate airborne sound insulation should be achieved between sensitive spaces and occupied spaces	Poor acoustic control between partitioned areas.	2	**2.4**	6	Will be achieved.	5	**6.0**	6	Generally good with rooms separated by solid concrete blockwork walls. Ceiling void requires upgrading.	3	**3.6**	6	Will be achieved.	5	**6.0**	6
Reduction of CO2 levels	BREEAM	Defined improvements against Building Regulations levels	No CO2 reduction measures in place, EPC score of 146 - Grade F over building benchmark of 100.	1	**1.0**	5	Minimum Building Regulations levels will be achieved but scope to exceed standards is limited.	4	**4.0**	5	No CO2 reduction measures in place, EPC score of 77 - Grade D over building benchmark of 100. Inefficient comfort cooling with ad hoc arrnagement of localised DX units.	2	**2.0**	5	Minimum Building Regulations levels will be achieved but scope to exceed standards is limited.	4	**4.0**	5
TOTAL SCORE					**46.6**	100			**78.9**	100			**45.4**	100			**77.1**	100

Notes

Each criteria can achieve a maximum score of 5

Appendix E: Waste carrier details and landfill capacity

Ellen Huelin

From: Ellen Huelin
Sent: 20 June 2023 16:41
To: paul.bush@veolia.com
Cc: Graeme Whyte
Subject: RE: New account - Devonshire Place
Attachments: Re: RE: New account

Hi Paul

Hope you are well, you kindly provided confirmation to our client Regal that you had sufficient capacity at landfill for their site at Wembley. We have another scheme going in for Planning (Devonshire Place, Old Kent Road) mixed use student accommodation and residential scheme with commercial space. Can you confirm the same for this site please?

We previously received confirmation, is this also the same?

Noted the destinations of waste streams will be to the Materials Recovery Facility (MRF) located in the London Borough of Southwark

We need to finalise the report tomorrow so apologies for the short turnaround, an email to confirm would be great.

Many thanks

Kind regards

Ellen

From: Jon Miller <Jon.Miller@regal-london.co.uk>
Sent: Monday, September 26, 2022 2:12 PM
To: Ellen Huelin <ellen.huelin@whitecode.co.uk>; paul.bush@veolia.com; Katy Venables <katy.venables@whitecode.co.uk>
Cc: Chris Deeks <Chris.Deeks@regal-london.co.uk>; Adam Hampton-Matthews <AHampton-Matthews@ryderarchitecture.com>; 10748:00 Fulton Road <FTRD@ryderarchitecture.com>
Subject: RE: New account

Ellen, Katy,

Please see attached and confirm acceptance.

Thanks,

REGA

Jon Miller
Design Manager
t: +44 (0)20 7328 7171 dd: +44 (0)20 7328 7171 m: +44 (0)7391 682 568
e: Jon.Miller@regal-london.co.uk
w: www.regal-london.co.uk
4-5 Coleridge Gardens, London, NW6 3QH

Appendix F: Lean design options

Reviewed in WLC report

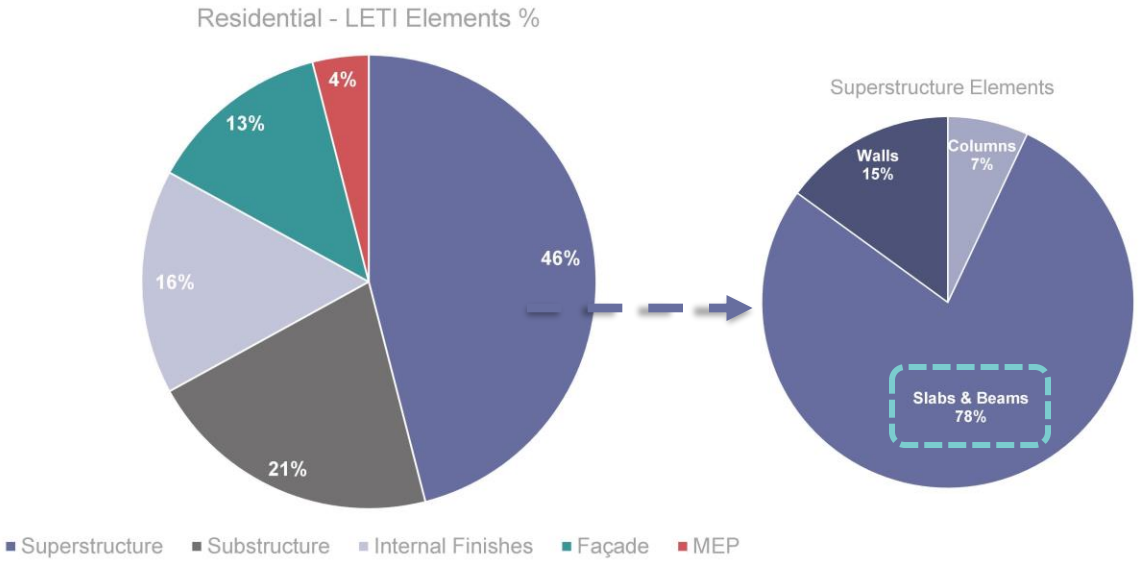
Pell Frischmann

Lean design and material choices

CFR - Embodied Carbon

Why structures are important in reducing carbon and cost

- Typical residential breakdown (LETI) – almost 70% of embodied carbon is in the structure
- PF studies – almost 80% of the "structural" carbon is in the floor
- **21%** of the total carbon is in the **foundations**
- **36%** of the total carbon is in the **floor** structure
- The heavier the floor, the bigger the foundations – focus on floors



How to use less – Key Strategies, small changes add up

Scope	Initiative	PF - Potential further carbon\material savings
Challenge load allowances and current design practice	Evaluate floor finishes options	**7%**
	Assess Partitions weight	**<1%**
	Load combinations	**<1%**
	Imposed load reduction (floor)	**<1%**
	Imposed load reduction (columns)	Included in Stage 2
Structural design and performance	Target high utilisation	**5%** (detailed design)
	Reassess serviceability	**2%** (detailed design)
	Installation of the façade and finishes at 90 days	**2%** (detailed design)
	Floor options study	Included in Stage 2
	Structural grid (perimeter)	**3%** (internal grid included in Stage 2)
	56-Day Concrete Strength	**5%**
Manufacture & construction: modular reinforcement units & BIM	Construction tolerances – material safety factors	**1%**
	Optimized manufacture	**5%**
	Waste reduction	**2%**
Materials	Cement Substitution	Included in Stage 2.
	XCarb steel	**10%** (depending on availability)

Example - Reduce the Dead Loads – Finishes

-6% -12% -7%

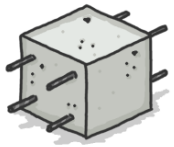
	Traditional Screed	Cradle and Batten	Reduction
Self-weight	1.74 kN/m^2	0.35 kN/m^2	80% in SIDL Reduce slab reinforcement and potentially save on piles
Thickness	125 mm	125 mm	-
Programme	Slower	Quicker by 30% (no wet trade)	30%

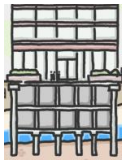
Example - Reduce Perimeter Grid – (uses PT as a base option, as example only)

- Smaller perimeter grids are better
- Changes in RC option can vary much more – too reliant on reinforcement
- Impact on internal layouts and elevations

Option	Perimeter Span (m)	Slab Depth (mm)			
PT	7.2 (base option)	225	0%	0%	0%
	6.5	225	-3%	0%	-2%
	6	225	-6%	0%	-3%
RC	7.2	265	+75%	+9%	+19%
	6.5	245	+45%	+5%	+11%
	6	225	+13%	0%	+5%

Overall design choices savings – example

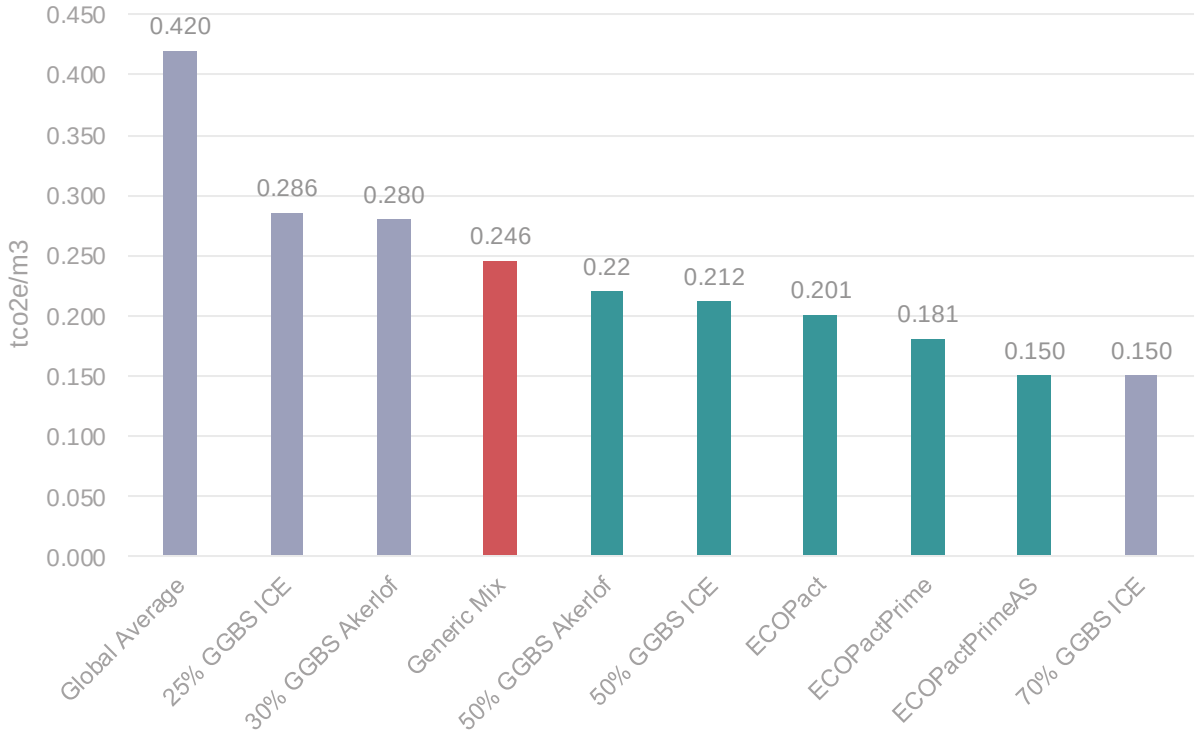




		Slab Reinforcement	Foundation Loads	Structure EC
	Baseline			
Engineering Input	Finishes - No Screed	-6%	-12%	-7%
Engineering Input	Reduce Loads by Being Code Smart	-5%	-2%	-2%
Performance Specifications & Contractor Input	90 Day Façade Installation	-3%	0%	-2%
Performance Specifications & Contractor Input	56 Day Strength Concrete	0%	0%	-5%
Performance Specifications & Contractor Input	Reduce Material Factors	-4%	0%	-1%
Architectural Input	Reduce Perimeter Grid	-6%	0%	-3%
Potential Total Reductions		**-24%**	**-14%**	**-20%**

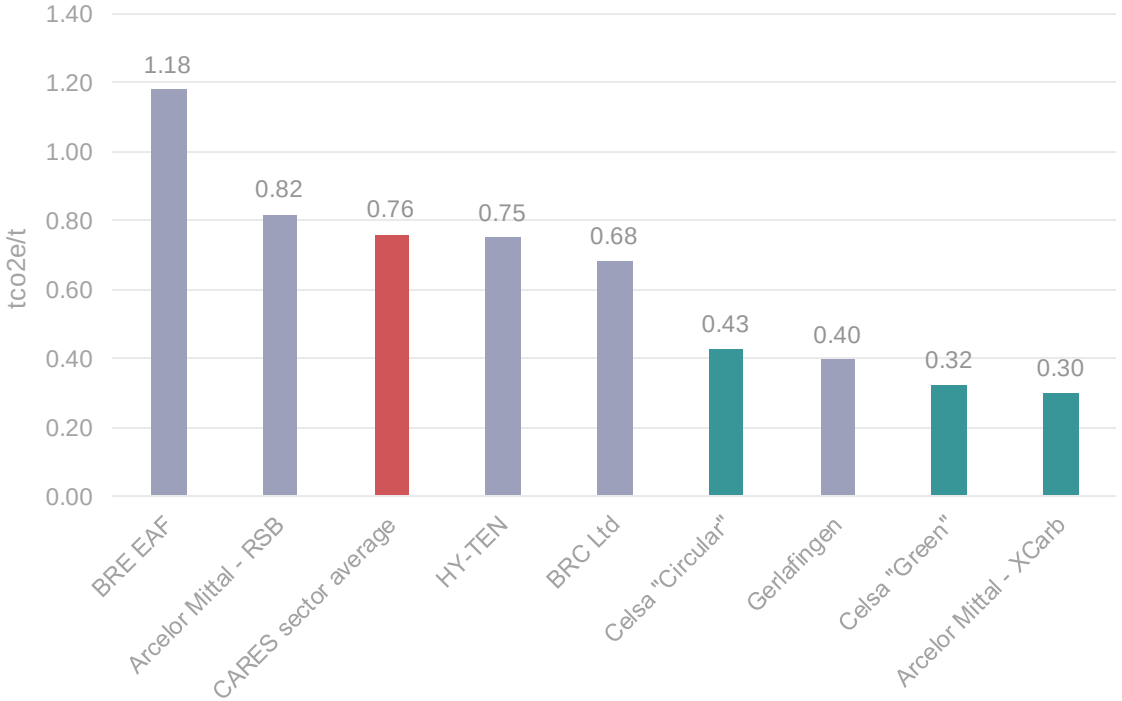
Material – concrete mix and rebar sourcing

Concrete Carbon Factor (A1-A3)



- Due to demand GGBS costs more than standard CEM1
- Using less in the first place is key

Rebar Carbon Factors (A1-A3)



- Using less in the first place is key
- Low carbon options cost more

Pell Frischmann

Excellence through innovation

Appendix G: Scenario modelling for adaptability

5.0 Development Options Sustainability Assessment

5.8 Circular Economy, Future Flexibility, Adaptability & Resiliance to Climate Change

To evaluate future proofing the full life cycle of a building should be considered alongside the six circular economy principles. To consider this factor we have assessed:

- How the options would offer future flexibility in terms of adaptability and reuse.
- How the options would improve health & wellbeing
- The ability of the development to deliver on the six circular design principles

Future Flexibility and Adaptability
To enable longevity of the built environment there is a need to allow for change, to meet the needs of the present, but with consideration of how those needs might change in the future, and to enable periodic remodelling. A 'loose fit' approach will more easily enable modifications and replacement of parts, with space for alternative technologies. Flexibility is required in order to balance the needs of the present with how those needs will develop over time and to enable change through easy reconfiguring, with minimum carbon emissions.

Given that the fundamental problems of 100 Chalk Farm Road remain after a retrofit and that the existing structure has a shorter lifespan due to its age, there is a concern that comprehensive refurbishments would be required every c.15 years.

For Options 1 and 2 where the existing building structure is retained, there is less scope for flexibility and adaptability. The existing structure has its own constraints as identified on section 4.0 of this report including limited access and varying levels, potentially reducing the options for future repurposing compared to Option 3.

For Option 3, the new PBSA building above ground level has been designed with reusability, recoverability, longevity, adaptability and flexibility in mind.

The new build structure would have a higher loading capacity than Options 1 and 2, increasing the optionality to repurpose to different uses without the need to strengthen the structure or foundations.

A new building approach for 100 Chalk Farm Road will deliver a commercial development asset fit for the next 60 years (minimum life span of the structure) with a predicted comprehensive refurbishment required in 30 years' time, double that for Option 1.

In addition, Options 2 and 3 are targetting a BREEAM rating of Outstanding (Excellent as a minimum) and a Nabers score of 5* (operational energy). Carrying out a BREEAM and Nabers assessment on Option 1 is outside of the scope of this report. However it can be reasonably expected that the constraints of the existing building, alongside viability considerations, would make these standards extremely challenging to meet.

Incorporating Wellbeing
Wellbeing in the built environment refers to the development of environments that positively support and or encourage improvements in building users' physical and mental health. For example, a building might:

- Support active modes of transport / active travel facilities (e.g. with cycle storage, showers).
- Optimise access to daylight and fresh air.
- Provide access to outdoor green space & support biophilia.
- Provide multi-purpose rooms supporting the wellbeing of users.

Many of these approaches connect to broader net zero strategies, and other significant human systems like transport and food production.

With the removal of the existing car park, all the considered options would be car free. In addition to the removal of on-site parking, this will have a positive impact on local air quality by reducing vehicles movements to and from the site. Additionally for all options cycle facilities would be provided to support active travel and align with current policies. Access to outdoor amenity space could potentially be provided on Options 1 and 2, however existing loading capacity may constrain the ability to do so. This amenity will be provided on the new podium and specified roofs of option 3.

Access to outdoor amenity spaces, namely terraces at different levels and landscaped public realm, can be provided throughout on Option 3. The planning application incorporates a biodiverse planting palette to encourage local wildlife.

The ecological emergency:
The planning scheme (Option 3) addresses the ecological emergency by creating a valuable local addition of biodiversity in an Area of Deficiency in public access to nature by providing significant biophilic benefits for occupiers, their guests and the public. The Urban Greening Factor (UGF) for Option 3 addresses the policy target of 0.3. It is beyond the scope of this exercise to calculated the comparable UGF for a retention scheme due to the level of design work required to calculate. However the retention schemes offer fewer opportunities for public realm creation and incorporating green and blue roofs due to design constraints and structural limitations. As such it would be fair to assume they would achieve a lower score.

Circular Economy
In line with the principles of a circular economy, first the condition of the existing site must be considered for any opportunities for a refurbishment in order to prevent waste prior to a new building being developed. This approach has been fully considered through a holistic evaluation of potential retention options when compared to the new build option as set out in this report. A circular economy statement has been developed for Option 3 (submitted scheme) to inform and establish relevant targets, and inform the approach to reusing existing materials, and minimise waste in construction, operation and end of life.

The Circular Economy principles are:

- Building in layers - Ensuring different parts of the Development are accessible and can be maintained and replaced where necessary. Maximise material recovery from the existing site in line with the waste hierarchy. Goal to recycle 95% of the material.
- Designing out waste: 95% reuse/recycling/recovery of construction and demolition waste.
- Designing for longevity - Designing to avoid a premature end of life for all components through considering maintenance and durability - Durability of materials used to be considered at outline specification stage and built into the design.
- Designing for adaptability or flexibility - Consider how the Development might be easily altered structurally to prolong its life. Consider how the Development might allow easy rearrangements of its internal fit-out and to suit the changing needs of occupants. Utilise soft spots to allow different floors to be connected to suit future needs.
- Designing for disassembly - Consider how the Development can be deconstructed and reconstructed to allow components and materials to be salvaged for reuse or recycling, whilst maintaining their economic and environmental value. Utilise modular and pre-fabricated components where possible.
- Using systems, elements or materials that can be reused and recycled - Aim for 20% recycled of recycled content by value, for the whole building and 50% of new construction materials to consist of recyclable materials.

Options 1 and 2 would be expected to produce less waste compared to Option 3. To address the circular economy priorites for Option 3 the below strategies have been proioritised:

- Backfilling on site with demolition material.
- Working with contractors to recycle 95%+ of waste.
- Prefabrication off site of component design.
- Exploring reuse of existing building materials within design.

Please refer to the Circular Economy Statement (CES) submitted with this application for further information.

5.0 Development Options Sustainability Assessment

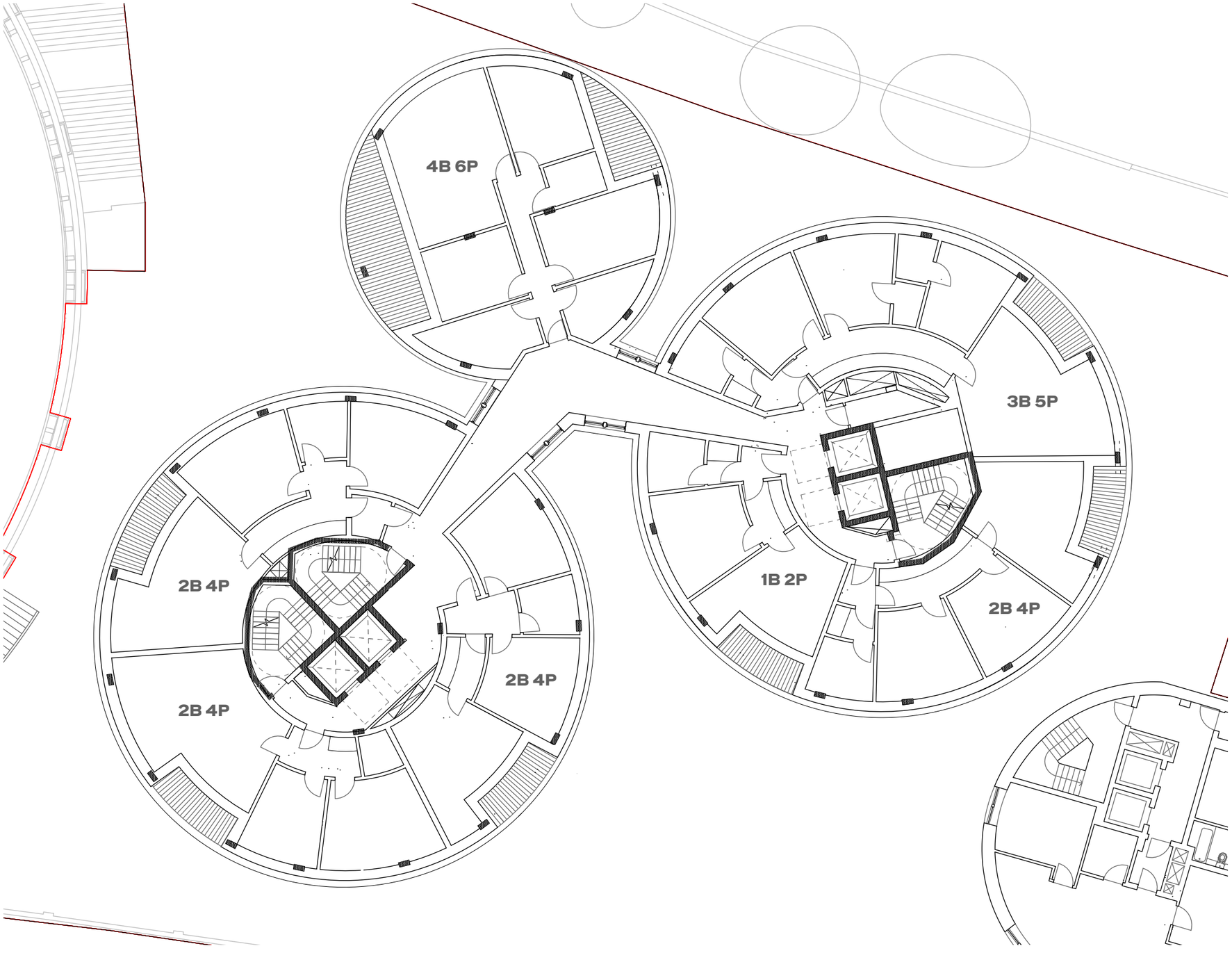
5.8 Circular Economy, Future Flexibility, Adaptability & Resiliance to Climate Change

Overview:
The plan on this page demonstrates the potential for the proposed PBSA building, Option 3, to be converted to private residential use in future.

The floor to floor heights for the PBSA building proposal are designed to work in future with minimum heights required for residential use. The design of the cores would allow for future conversion to residential use as it has similar requirements in terms of the number of stairs and lifts. The proposed insitu concrete floor slabs would also allow for new openings to be made in the slab for staircases within residential units and/or additional servicing if required.

External private amenity spaces:
This plan for the potential future conversion of the PBSA building to residential use includes inset balconies, to provide the required private amenity space for each residential unit. Inset balconies are proposed as opposed to clip-on balconies so as not to create problems around privacy and with proximity to neighbouring buildings. Inset balconies also would not disrupt the overall form and autonomy of the three cylinders.

Structural Engineering Considerations:
As outlined on page 82, serveral option habe been considered for ways to provide private external amenity should a conversion to private residential use be sought. Of the options considered, Option 3 represents the most suitable solution by providing soft spots in the slab locally to a balcony.

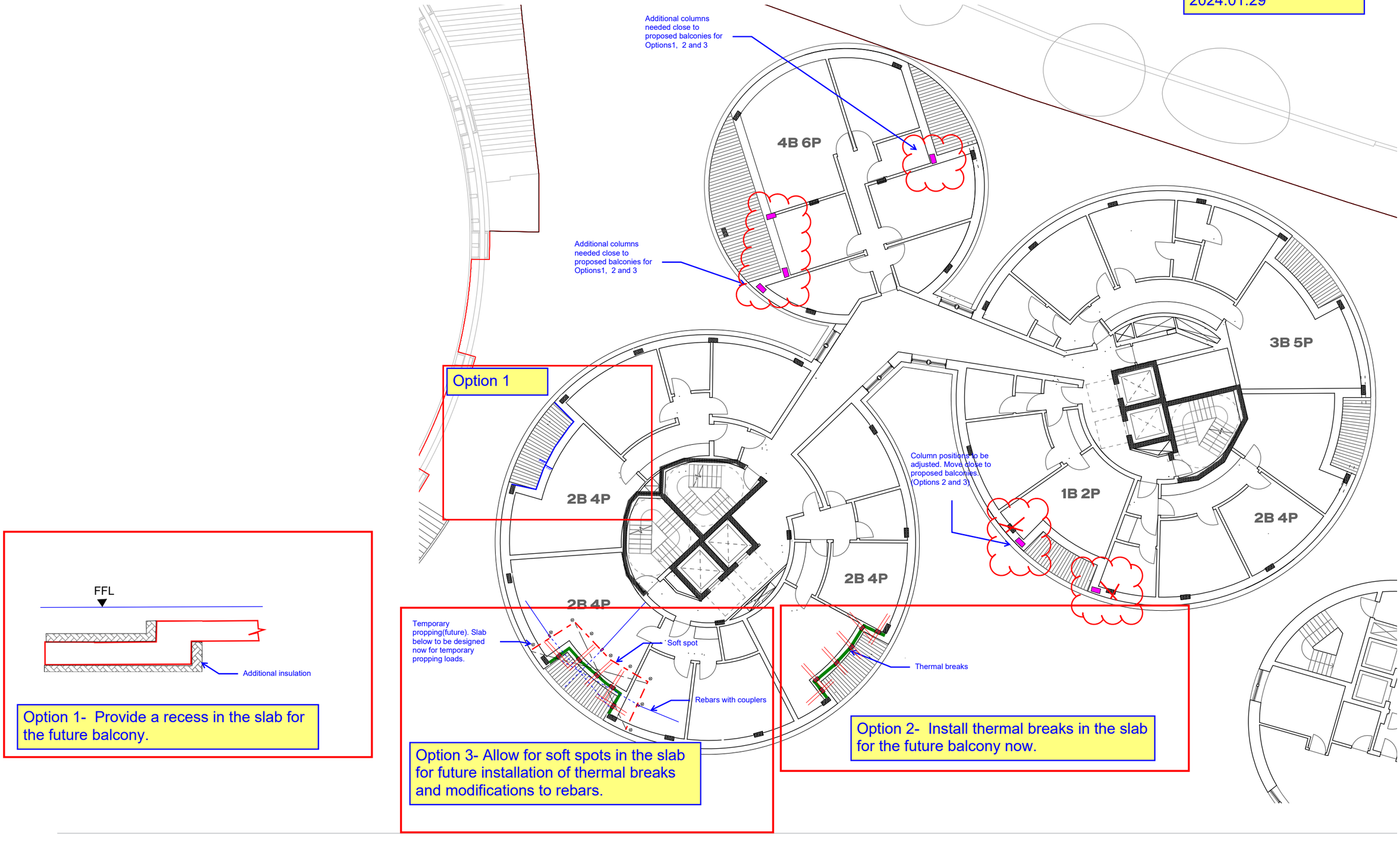


Typical Floor Residentail Conversion Plan

5.0 Development Options Sustainability Assessment

5.8 Circular Economy, Future Flexibility, Adaptability & Resiliance to Climate Change

Comments by
Pell Frischmann
2024.01.29



Appendix H: One Click LCA output

Entity users	Project name	Design n	Indicator name
Katy Venables	Chalk Farm New Build	2 - Chalk	Building Circularity, Greater London Authority

RICS category	Resource type	Section	Resource	User inp	Unit	Total kg	Virgin kg	Waste factor	Material quantity (Module A) k	Renewable k	Non-renewable materials k	Recycled k	Reused k	Recycled content by value	Recycling %	Reusing %	Downcycling k	Use as energy k	Disposal k	Question	Service life	DfD	DfA	Comment	EOL Process	Renewable	Recycled	Reused	Total cost	uniClass	csiMasterformat
1.1.1.Standard foundations	Ready-mix concrete for structures (beams, columns	A1-A3-ful	Ready-mix concrete, normal-strength, ger	1869	ton	1869000	1812930	0.04	1943760	0	1869000	56070	0	0.096			1869000			Foundation, sub-surface, basement and retaining walls	As building			Piling	Concrete crushed to aggregate (for sub-base layers), Portland Cement 40(	0	3	0	102535	P2	3
1.1.1.Standard foundations	Ready-mix concrete for structures (beams, columns	A1-A3-ful	Ready-mix concrete, normal-strength, ger	1376	ton	1376000	1334720	0.04	1431040	0	1376000	41280	0	0.071			1376000			Foundation, sub-surface, basement and retaining walls	As building			Pile Caps	Concrete crushed to aggregate (for sub-base layers), Portland Cement 40(	0	3	0	75489	P2	3
Subtotal for Resource type = Ready-mix concrete for structures (beams, columns, piling):						**3245000**	**3147650**	**0.04**	**3374800**	**0**	**3245000**	**97350**	**0**	**0.17**			**3245000**			**Foundation, sub-surface, basement and retaining walls**						**0**	**3**	**0**	**91066.5**		
1.1.1.Standard foundations	Reinforcement for concrete (rebar)	A1-A3-ful	Reinforcement steel (rebar), generic, 97%	130	ton	130000	3900	0.048	136305	0	130000	126100	0	2.26	100					Foundation, sub-surface, basement and retaining walls	As building			Piling	Steel recycling	0	97	0	74522	P4	5
1.1.1.Standard foundations	Reinforcement for concrete (rebar)	A1-A3-ful	Reinforcement steel (rebar), generic, 97%	78	ton	78000	2340	0.048	81783	0	78000	75660	0	1.36	100					Foundation, sub-surface, basement and retaining walls	As building			Pile Caps	Steel recycling	0	97	0	44713	P4	5
Subtotal for Resource type = Reinforcement for concrete (rebar):						**208000**	**6240**	**0.048**	**218088**	**0**	**208000**	**201760**	**0**	**3.62**	**100**					**Foundation, sub-surface, basement and retaining walls**						**0**	**97**	**0**	**63343.62**		
Subtotal for RICS category = 1.1.1.Standard foundations:						**3453000**	**3153890**	**0.041**	**3592888**	**0**	**3453000**	**299110**	**0**	**3.79**	**6.02**		**3245000**			**Foundation, sub-surface, basement and retaining walls**						**0**	**8.66**	**0**	**89396.54**		
1.1.3.Lowest floor construction	EPS (expanded polystyrene) insulation	A1-A3-ful	EPS insulation panels, graphite, L = 0.037	1953	m2	2929.5	1611.22	0.04	3046.68	0	2929.5	1318.28	0	0.34				2929.5		Foundation, sub-surface, basement and retaining walls	As building				Plastic-based material incineration	0	45	0	24475	P7	7
Subtotal for Resource type = EPS (expanded polystyrene) insulation:						**2929.5**	**1611.22**	**0.04**	**3046.68**	**0**	**2929.5**	**1318.28**	**0**	**0.34**				**2929.5**		**Foundation, sub-surface, basement and retaining walls**						**0**	**45**	**0**	**24475**		
1.1.3.Lowest floor construction	Ready-mix concrete for external walls and floors	A1-A3-ful	Ready-mix concrete, normal-strength, ger	1420	ton	1420000	1377400	0.04	1476800	0	1420000	42600	0	0.07			1420000			Foundation, sub-surface, basement and retaining walls	As building			Lowest Floor	Concrete crushed to aggregate (for sub-base layers), Portland Cement 30(	0	3	0	75092	P2	3
Subtotal for Resource type = Ready-mix concrete for external walls and floors:						**1420000**	**1377400**	**0.04**	**1476800**	**0**	**1420000**	**42600**	**0**	**0.07**			**1420000**			**Foundation, sub-surface, basement and retaining walls**						**0**	**3**	**0**	**75092**		
1.1.3.Lowest floor construction	Reinforcement for concrete (rebar)	A1-A3-ful	Reinforcement steel (rebar), generic, 97%	70	ton	70000	2100	0.048	73395	0	70000	67900	0	1.22	100					Foundation, sub-surface, basement and retaining walls	As building			Lowest Floor	Steel recycling	0	97	0	40127	P4	5
Subtotal for Resource type = Reinforcement for concrete (rebar):						**70000**	**2100**	**0.048**	**73395**	**0**	**70000**	**67900**	**0**	**1.22**	**100**					**Foundation, sub-surface, basement and retaining walls**						**0**	**97**	**0**	**40127**		

5.6.Space heating and Airconditioning	HVAC components and equipment	A1-A3-ful	Electricity distribution system, cabling anc	12982	m2	51408.72	51408.72	0.01	51922.81	0	51408.72	0	0	0	100					Building systems and installations	30		Metal-containing product recycling (90 % metal)	0	0	0		P8	23
5.6.Space heating and Airconditioning	HVAC components and equipment	A1-A3-ful	Air handling unit, with heat recovery throu	3.4	unit	4274.27	4274.27	0.01	4317.02	0	4274.27	0	0	0	100					Building systems and installations	25		Metal-containing product recycling (90 % metal)	0	0	0		P8	23
5.6.Space heating and Airconditioning	HVAC components and equipment	A1-A3-ful	Ventilation ducting, per m linear, D: 63 mr	4271.08	m	3630.42	3630.42	0.01	3666.72	0	3630.42	0	0	0	100					Building systems and installations	40		Metal-containing product recycling (90 % metal)	0	0	0		P8	23
5.6.Space heating and Airconditioning	HVAC components and equipment	A1-A3-ful	District heat distribution center, per 1kW	846.43	kW	3893.58	3893.58	0.01	3932.51	0	3893.58	0	0	0	100					Building systems and installations	30		Metal-containing product recycling (90 % metal)	0	0	0		P8	23
5.6.Space heating and Airconditioning	HVAC components and equipment	A1-A3-ful	Water circulation radiator, per 1kW / unit	1298.2	kW	67856.91	67856.91	0.01	68535.48	0	67856.91	0	0	0	100					Building systems and installations	30		Metal-containing product recycling (90 % metal)	0	0	0		P8	23
Subtotal for Resource type = HVAC components and equipment:						**131063.9**	**131063.9**	**0.01**	**132374.54**	**0**	**131063.9**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
Subtotal for RICS category = 5.6.Space heating and Airconditioning:						**131063.9**	**131063.9**	**0.01**	**132374.54**	**0**	**131063.9**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
5.8.3.Lighting installations	Lighting	A1-A3-ful	Fluorescent lamp, T8-18W, 0.07 kg/unit	761.55	unit	56.21	56.21	0	56.21	0	56.21	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.3.Lighting installations	Lighting	A1-A3-ful	Interior projector LED 14 W, Projecteur ir	786.93	unit	590.2	590.2	0	590.2	0	590.2	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.3.Lighting installations	Lighting	A1-A3-ful	Interior LED projector, P= 14 à 30 W, Pro	3122.34	unit	3743.69	3743.69	0	3743.69	0	3743.69	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.3.Lighting installations	Lighting	A1-A3-ful	Waterproof lighting, P=18 W, Luminaire é	1074.63	unit	1024.66	1024.66	0	1024.66	0	1024.66	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.3.Lighting installations	Lighting	A1-A3-ful	Indicator lights, P=0.035W, 0.002 kg/unit	416.61	unit	0.83	0.83	0	0.83	0	0.83	0	0	0	100					Building systems and installations	15	fire alarm	Metal-containing product recycling (90 % metal)	0	0	0		P8	26
Subtotal for Resource type = Lighting:						**5415.58**	**5415.58**	**0**	**5415.58**	**0**	**5415.58**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
Subtotal for RICS category = 5.8.3.Lighting installations:						**5415.58**	**5415.58**	**0**	**5415.58**	**0**	**5415.58**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Emergency evacuation lighting, 0.604 kg/	296.16	unit	178.88	178.88	0.01	180.67	0	178.88	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Light switch, 0.113 kg/unit, 077001L (méc	3985.43	unit	450.35	450.35	0.01	454.86	0	450.35	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Lighting management sensors, 0.31 kg/un	3240.8	unit	1004.65	1004.65	0.01	1014.69	0	1004.65	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Socket outlet 2P+T, 0.173 kg/unit, Plexo 2	13411.7	unit	2320.22	2320.22	0.01	2343.43	0	2320.22	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Junction box, 0.154 kg/unit, IP55 100x10(	2047.71	unit	315.35	315.35	0.01	318.5	0	315.35	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Recessed box for electrical equipment, 0.(	6794.69	unit	210.64	210.64	0.01	212.74	0	210.64	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Power cable connectors, Connecteur pen	3486.19	unit	1017.1	1017.1	0.01	1027.27	0	1017.1	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Smoke detector, French average, Détecte	2410.38	unit	1205.19	1205.19	0.01	1217.24	0	1205.19	0	0	0	100					Building systems and installations	15	fire alarm	Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Output device, 0.382 kg/unit, TYA606E TY	44.64	unit	17.05	17.05	0.01	17.22	0	17.05	0	0	0	100					Building systems and installations	15	fire alarm	Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.8.Electrical installations	Electrification components and systems	A1-A3-ful	Electrical junction box, French average, B	18.6	unit	2.6	2.6	0.01	2.63	0	2.6	0	0	0	100					Building systems and installations	15	fire alarm	Metal-containing product recycling (90 % metal)	0	0	0		P8	26
Subtotal for Resource type = Electrification components and systems:						**6722.03**	**6722.03**	**0.01**	**6789.25**	**0**	**6722.03**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
Subtotal for RICS category = 5.8.Electrical installations:						**6722.03**	**6722.03**	**0.01**	**6789.25**	**0**	**6722.03**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
5.Services	Cables	A1-A3-ful	Low voltage cable, Section conductrice de	15733.6	m	21397.7	21397.7	0.01	21611.67	0	21397.7	0	0	0	100					Building systems and installations	15		Metal-containing product recycling (90 % metal)	0	0	0		P8	26
5.Services	Cables	A1-A3-ful	Communication cable, 0.231 kg/m, Câble	11159.2	m	2577.78	2577.78	0.01	2603.55	0	2577.78	0	0	0	100					Building systems and installations	15	fire alarm	Metal-containing product recycling (90 % metal)	0	0	0		P8	26
Subtotal for Resource type = Cables:						**23975.47**	**23975.47**	**0.01**	**24215.23**	**0**	**23975.47**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
5.Services	Energy production systems from renewable energy	A1-A3-ful	Photovoltaic polycrystalline panel, per m2	176	m2	2552	2552	0	2552	0	2552	0	0	0	100					Building systems and installations	20	86 PV 1754mm x 1164mm	Metal-containing product recycling (90 % metal)	0	0	0		P8	26
Subtotal for Resource type = Energy production systems from renewable energy:						**2552**	**2552**	**0**	**2552**	**0**	**2552**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
5.Services	HVAC equipment with refrigerant	A1-A3-ful	Air/air heat pump, ducted, 61.5 kg/unit, P	5	unit	307.5	307.5	0	307.5	0	307.5	0	0	0	100					Building systems and installations	15	Student Cores: CLADE ROWAN PROPANE - 1x SN/150, 2x SN/225Resi Core:	Metal-containing product recycling (90 % metal)	0	0	0		P8	23
Subtotal for Resource type = HVAC equipment with refrigerant:						**307.5**	**307.5**	**0**	**307.5**	**0**	**307.5**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
5.Services	Hot-dip galvanized/zinc coated steel	A1-A3-ful	Hot dip galvanized steel, 0.73 mm, 5.72 kg	1082.37	kg	1082.37	324.71	0.075	1163.55	0	1082.37	757.66	0	0.027	100					Building systems and installations	30	sprinkler	Steel recycling	0	70	0	1241	P4	5
Subtotal for Resource type = Hot-dip galvanized/zinc coated steel:						**1082.37**	**324.71**	**0.075**	**1163.55**	**0**	**1082.37**	**757.66**	**0**	**0.027**	**100**					**Building systems and installations**				**0**	**70**	**0**	**1241**		
5.Services	Other metals	A1-A3-ful	Fire sprinkler, 0.072 kg/unit, Sprinkler per	3012.98	unit	216.93	216.93	0.075	233.2	0	216.93	0	0	0	100					Building systems and installations	30	sprinkler	Steel recycling	0	0	0		P4	5
Subtotal for Resource type = Other metals:						**216.93**	**216.93**	**0.075**	**233.2**	**0**	**216.93**	**0**	**0**	**0**	**100**					**Building systems and installations**				**0**	**0**	**0**			
5.Services	Paints, coatings and lacquers	A1-A3-ful	Waterborne alkyd modified acrylic paint f	410.66	kg	410.66	410.66	0.1	451.72	0	410.66	0	0	0					410.66	Building systems and installations	30	sprinkler	Landfilling (for inert materials)	0	0	0	2156	P7	9
Subtotal for Resource type = Paints, coatings and lacquers:						**410.66**	**410.66**	**0.1**	**451.72**	**0**	**410.66**	**0**	**0**	**0**					**410.66**	**Building systems and installations**				**0**	**0**	**0**	**2156**		
5.Services	Stainless steel	A1-A3-ful	Stainless steel sheet, 7900.0 kg/m^3	1886.42	kg	1886.42	754.57	0.025	1933.58	0	1886.42	1131.85	0	0.099	100					Building systems and installations	30	sprinkler	Stainless steel recycling	0	60	0	5287	P4	5
Subtotal for Resource type = Stainless steel:						**1886.42**	**754.57**	**0.025**	**1933.58**	**0**	**1886.42**	**1131.85**	**0**	**0.099**	**100**					**Building systems and installations**				**0**	**60**	**0**	**5287**		
Subtotal for RICS category = 5.Services:						**30431.35**	**28541.84**	**0.014**	**30856.78**	**0**	**30431.35**	**1889.51**	**0**	**0.13**	**98.65**				**410.66**	**Building systems and installations**				**0**	**6.21**	**0**	**400.97**		
8.2.1.Roads, paths and pavings	Brick, common clay brick	A1-A3-ful	Paving bricks and pavers, 200 x 100 x 52	1347	m2	140088	140088	0.05	147092.4	0	140088	0	0	0			140088			Materials and constructions for external areas	As building	Confirmed in Mat 01 RFI	Brick/stone crushed to aggregate (for sub-base layers)	0	0	0	20452	P33	4
Subtotal for Resource type = Brick, common clay brick:						**140088**	**140088**	**0.05**	**147092.4**	**0**	**140088**	**0**	**0**	**0**			**140088**			**Materials and constructions for external areas**				**0**	**0**	**0**	**20452**		
8.2.1.Roads, paths and pavings	Mortar (masonry/bricklaying)	A1-A3-ful	Cement mortar, gross density: 2000 kg/m	1387	m2	27740	27740	0.13	31346.2	0	27740	0	0	0			27740			Materials and constructions for external areas	30		Cement/mortar use in a backfill	0	0	0	11646	P2	4
Subtotal for Resource type = Mortar (masonry/bricklaying):						**27740**	**27740**	**0.13**	**31346.2**	**0**	**27740**	**0**	**0**	**0**			**27740**			**Materials and constructions for external areas**				**0**	**0**	**0**	**11646**		
8.2.1.Roads, paths and pavings	Wall and floor tiles	A1-A3-ful	Marble products for flooring and cladding	40	m2	1188	1188	0.1	1306.8	0	1188	0	0	0		100				Materials and constructions for external areas	10	Terrazo tiles - made from crushed brick on site		0	0	0	1362	P2	9
Subtotal for Resource type = Wall and floor tiles:						**1188**	**1188**	**0.1**	**1306.8**	**0**	**1188**	**0**	**0**	**0**		**100**				**Materials and constructions for external areas**				**0**	**0**	**0**	**1362**		
Subtotal for RICS category = 8.2.1.Roads, paths and pavings:						**169016**	**169016**	**0.063**	**179745.4**	**0**	**169016**	**0**	**0**	**0**		**0.7**	**167828**			**Materials and constructions for external areas**				**0**	**0**	**0**	**18872.52**		
Total:						**20441986.3**	**18717393.2**	**0.049**	**21443489.2**	**54141.26**	**20387845.02**	**1670451.9**	**0**	**23.69**	**13.43**	**0.63**	**17119798.93**	**150457.99**	**296936.95**					**0.26**	**8.17**	**0**	**192698.9**		

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