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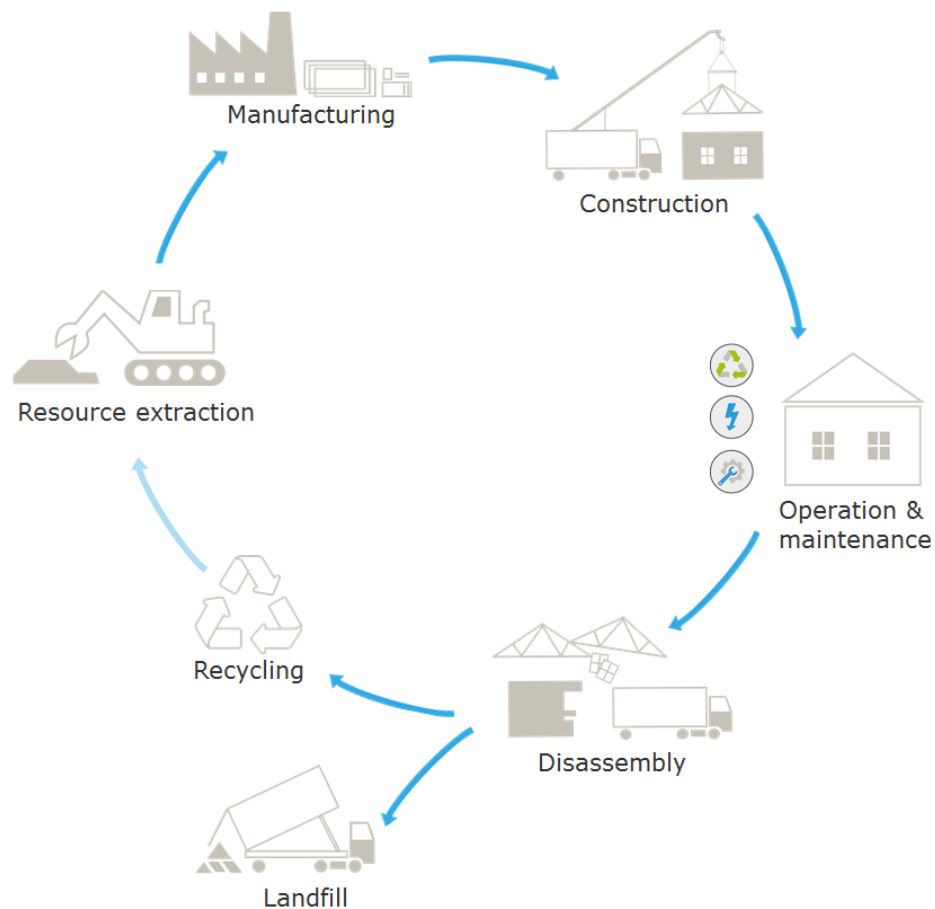
Report

Date

November 2023

BLOCK C, PLOT 11, FIRST STREET

MAT01 LCA - BREEAM UK NC 2018



BLOCK C, PLOT 11, FIRST STREET MAT01 LCA - BREEAM UK NC 2018

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1. EXECUTIVE SUMMARY

Ramboll has been appointed to undertake a Life Cycle Assessment (LCA) study in line with BREEAM UK NC 2018 Mat01 requirements for the new student accommodation at **Block C, Plot 11, First Street**. The proposed development will be 28 storeys (GIA 19,023m²).

This report summarises key findings to meet the requirements of UK BREEAM 2018 New Construction, issue Mat01-Environmental impacts from construction products – Building life cycle assessment (LCA). This report considers options for the Superstructure during the Concept Design Stage for Block C. The current analysis has assessed 4no. Superstructure options.

Table 1 provides details for the preferred option and Table 2 summarises all four design options explored for the Superstructure.

Table 1: Preferred design option.

	Superstructure	Embodied Carbon Footprint (kgCO ₂ e /m ² GIA)
Option 1 – Baseline/Preferred	RC concrete frame, concrete upper floors, solid concrete roof parapets, mixed SFS partitions, curtain wall glazing with aluminium rapid vents	347

Table 2: Summary of all design options.

		Carbon
Superstructure		kgCO₂e/m² of GIA
Opt. 1 – Baseline	<ul style="list-style-type: none"> As shown in Table 1 	347
Opt. 2 PT concrete	<ul style="list-style-type: none"> Alternative 225mm Post Tensioned slab replaces typical 250mm RC slab 	329
Opt. 3 Concrete post and beam parapet	<ul style="list-style-type: none"> Solid concrete parapet replaced with a beam and post structure, with SFS infill 	346
Opt. 4 Timber stud partitions*	<ul style="list-style-type: none"> Metal stud partitions replaced with timber studs 	337

*Partitions have been included as an option despite being outside the scope of the Mat 01 study. Since the building is residential and has a large number of internal walls, this option has been provided as it could offer significant carbon reduction potential. As it is out of scope, partitions are

not counted in the Mat01/02 tool calculated values. However, partitions have been included in the scope of the report here.

Following the superstructure options appraisal, the total embodied carbon emissions have been calculated based on the Option 1 – Baseline/Preferred option at this stage. This is illustrated in Figure 1 with approximate carbon dioxide equivalents.



Figure 1: Approximate equivalents to site total carbon dioxide emissions – Option 1 - Baseline.

Other parameters such as ease of construction, cost, availability, fire safety, additional complexity and suitability to the building design have been considered and have affected decisions as to which material solutions are more efficient not only in terms of carbon emissions, but also when considering time requirements and cost impacts.

2. INTRODUCTION

2.1 Site

The proposed development includes one block - Block C - which is located in the south part of the site, highlighted in blue.

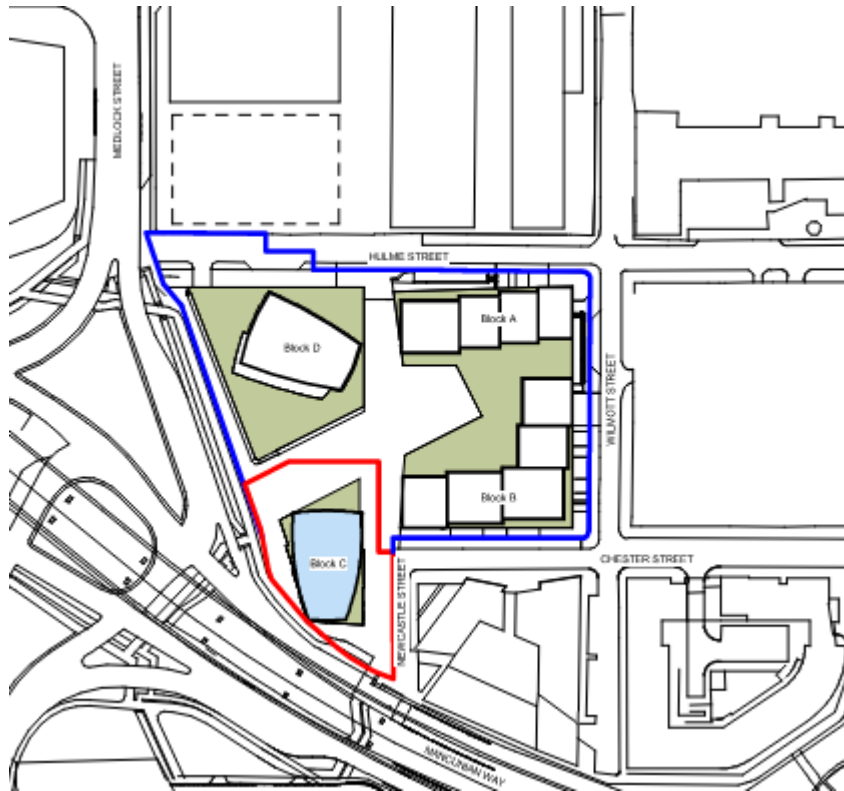


Figure 2: The site location (Source: SimpsonHaugh, November 2023).

2.2 Block C

Block C is a multistorey development with student accommodation, comprising bedspaces and communal areas (Figure 3). The building will be 28 storeys with the RC frame and double-glazed aluminium curtain wall façade (Figure 4).

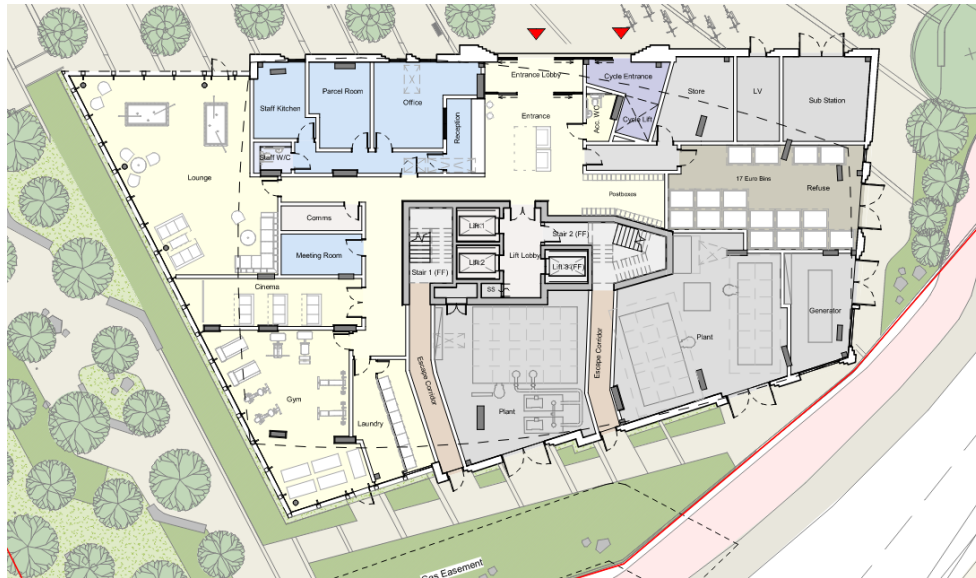


Figure 3: Block C ground floor, SimpsonHaugh, November 2023

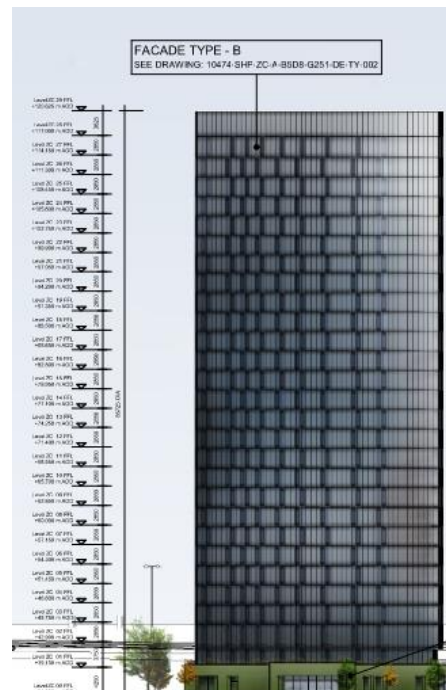


Figure 4: Block C visualisation, SimpsonHaugh, March 2023

3. BREEAM UK NC 2018, LCA REQUIREMENTS

3.1 Background to Life Cycle Assessments for the construction industry

With buildings' share of the global carbon emissions reaching 39%, there is no question that the built environment sector has a significant role to play in reducing global emissions and responding to the climate emergency. Carbon emissions from operational use of buildings has been the subject of regulation and until recently, the primary focus for reducing the environmental impact of buildings. With increasing energy efficiency within buildings and an increasingly decarbonised electricity supply, building operational carbon emissions are being acknowledged to be rapidly reducing. While we must continue to focus on reducing operational carbon, we must also increase efforts to tackle embodied carbon emissions. Embodied carbon emissions are the emissions associated with the manufacturing, transportation, construction, and end of life stages of all built assets and contribute around 11% of all global carbon emissions and can be quantified by undertaking a Life Cycle Assessment study.

Life Cycle Assessment (LCA) is an established method of assessing the cumulative environmental impacts associated with all lifecycle stages of a product, process, or a whole construction project. An LCA can help inform decision making not only in terms of identifying measures to reduce carbon emissions, but also in relation to other environmental indicators such as material, water, and energy use across the whole lifecycle.

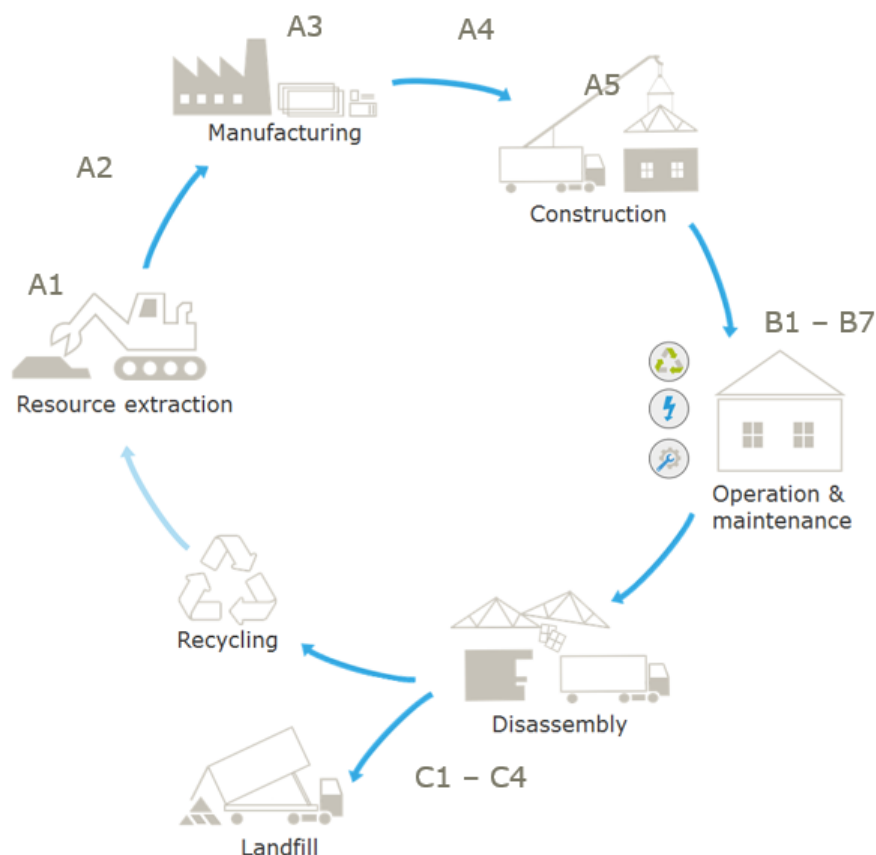


Figure 5: LCA and Life Cycle Stages.

3.2 BREEAM UK NC 2018, Mat01 requirements

BREEAM UK 2018, Mat01 issue '*Environmental impacts from construction products - Building life cycle assessment (LCA)*' includes seven credits (Criteria 1 to 7) and three exemplary credits (Criteria 8 to 18) are available. Criteria 1 and 2 that require a comparison with the BREEAM LCA benchmark during Concept Design and Technical Design respectively, are only available for office, industrial and retail buildings. Following credits are targeted:

SUPERSTRUCTURE

- Criterion 1 - Comparison with the BREEAM LCA benchmark during Concept Design: (office, industrial and retail buildings only) - Not required for residential projects
- Criteria 3, 4 – Options appraisal during Concept Design: Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options - **Targeted**

SUBSTRUCTURE

- Criteria 6 and 7 – Substructure and hard landscaping options appraisal during Concept Design: Not targeted

EXEMPLARY LEVEL CRITERIA

- Criteria 8 to 10: Not targeted

Overall, 4no. Superstructure options have been assessed to achieve the maximum number of credits available under Criteria 3 & 4 at the Concept Design stage.

3.3 LCA software

The LCA assessment and options appraisal has been undertaken using the Bionova Ltd. 'OneClick LCA' software. OneClick LCA is approved as IMPACT-compliant by BRE and has been developed to comply with the BS EN 15978: 2011 – *Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method* requirements.

OneClick LCA for BREEAM UK tool is also included in the 'Building LCA tools recognised by BREEAM' list, approved for the Superstructure, Substructure and Hard Landscaping options appraisal, as per Knowledge Base note KBCN1118.

3.4 LCA life cycle stages and scope of assessment

According to BREEAM UK 2018, Mat01 requirements the LCA assessment should cover the following life cycle stages:

- Stages A1-A3,
- Stages A4 and A5, where possible in the building LCA tool, and
- Stages B-C, each module possible in the building LCA tool used.

Table 3 presents the life cycle stages in accordance with BS EN 15978:2011 and highlights the life cycle stages included within the current assessment. Table 4 provides an overview of the emissions included within each life cycle stage.

Table 3: Life cycle stages and scope of assessment in line with EN 15978: 2011.

WHOLE LIFE CARBON ASSESSMENT INFORMATION															
PROJECT LIFE CYCLE INFORMATION											SUPPLEMENTARY INFO				
A1 – A3 PRODUCT STAGE			A4 – A5 CONSTRUCTI ON PROCESS STAGE		B1 – B7 USE STAGE				C1 – C4 END OF LIFE STAGE				D BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY		
RAW MATERIAL EXTRACTION AND SUPPLY	TRANSPORT TO MANUFACTURING PLANT	MANUFACTURING AND FABRICATION	TRNSPORT TO PROJECT SITE	CONSTRUCTION AND INSTALLATION PROCESS	USE	REPLACEMENT	REFURBISHMENT	DECONSTRUCTION DEMOLITON	TRANSPORT TO DISPOSAL FACILITY	WASTE PROCESSING	DISPOSAL	REUSE, RECOVERY, RECYCLING POTENTIAL			
					B6 – OPERATIONAL ENERGY USE										
					B7 – OPERATIONAL WATER USE										
✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	excluded			

Table 4: Description of the life cycle stages in line with RICS professional statement 'Whole life carbon assessment for the built environment, November 2017.

	Life cycle stage	Description
Product stage	A1 – A3	A1 – A3 considers the carbon emissions attributable to the cradle-to-gate processes, including all emissions associated with the extraction, production and transportation of all materials and components.
	A4 Transportation to site	A4 transport emissions include all stages of the journey of the products following their departure from the final manufacturing plant to the project site, considering any interim stops at storage depot and/or distribution centres.
Construction process stage	A5 Construction and installation process	A5 includes all emissions associated with any on-site or off-site construction-related activities. This includes any energy consumption for site accommodation, plant use and the impacts associated with any waste generated through the construction process, its treatment and disposal.
	B1 – B5 Maintenance, Repair, Replacement	B1 – B5 use stage emissions include all emissions associated with the use, maintenance, repair, replacement, and refurbishment of the built asset.
Use stage	B6 Operational energy use	B6 includes the operational carbon emissions arising from the energy use of building-integrated systems as projected and/or measured throughout the life cycle of the project.
	B7 Operational water use	B7 includes all carbon emissions related to water supply and wastewater treatment.

End of Life stage	C1 – C4 End of Life stage	C1 – C4 EoL stages include any emissions arising from decommissioning, stripping out, disassembly, deconstruction and demolition operations as well as from transport, processing, and disposal of materials at the end of life of the project.
Benefits and loads	D Benefits and loads beyond the system boundary	Module D includes the potential environmental benefits or burdens of materials and components beyond the life of the project. Module [D] must be reported separately and not aggregated with cradle to grave modules A–C.

The LCA for Block C First Street will cover the Superstructure elements only. Table 5 indicates the in- and out-of-scope elements and sub-elements, as per BREEAM UK 2018 Mat01 requirements (Tables 9.1, 9.2, 9.5 and 9.6 of the BREEAM manual).

The scope of the study has been broadened beyond the Mat01 minimum scope to capture opportunities with internal partitions due to significant material quantities and carbon optimisation potential.

The study period of the LCA will be 60 years, which is in line with BREEAM Mat01 requirements.

Table 5: LCA in-scope and out-of-scope elements for the superstructure elements.

	Element	In-scope	Out-of-scope
Superstructure	1. Frame	<ol style="list-style-type: none"> Steel frames Space decks Concrete casings to steel frames Concrete frames Timber frames Other frame systems 	
	2. Upper floors	<ol style="list-style-type: none"> Floors 	<ol style="list-style-type: none"> Balconies- Optional
	3. Roof	<ol style="list-style-type: none"> Roof structure Roof coverings Specialist roof systems Rooflights, skylights and openings 	<ol style="list-style-type: none"> Roof features
	4. Stairs and ramps	<ol style="list-style-type: none"> Stair or ramp structures 	<ol style="list-style-type: none"> Stair or ramp finishes Stair or ramp balustrades and handrails Ladders, chutes, slides
	5. External walls	<ol style="list-style-type: none"> External enclosing walls above ground floor level External enclosing walls below ground level Solar or rain screening 	<ol style="list-style-type: none"> External soffits Subsidiary walls, balustrades, handrails, railings and proprietary balconies Façade access or cleaning systems
	6. Windows and external doors	<ol style="list-style-type: none"> External windows 	<ol style="list-style-type: none"> External doors - Optional

	Element	In-scope	Out-of-scope
	7. Internal walls and partitions	1. Internal walls and partitions (applicable to education buildings only) (<u>Included in the wider scope</u>)	1. Balustrades and handrails 2. Moveable room dividers 3. Cubicles
			1. Internal doors - Optional 2. Internal finishes to walls, floors, ceilings 3. Raised access floors, false ceilings 4. Demountable suspended ceilings 5. Minor fixings (e.g. brackets, nails, screws), sealants and ironmongery items 6. General fittings, furnishings and equipment 7. Domestic kitchen fittings and equipment 8. Special purpose fittings, furnishings and equipment 9. Signs or Notices 10. Works of art 11. Equipment 12. Adhesives: Excluded if the adhesive is applied to less than 20% of the product's surface. 13. Sealants 14. Electrical and mechanical equipment and controls, plumbing fixtures, fire detection and alarm system fixtures, elevators, conveying systems 15. Basement excavation 16. Non-structural fasteners, clips, connections (nails, screws, bolts) 17. Surface treatments (e.g. weatherproofing, fire retarding coatings) 18. Temporary works used during construction and demolition/de-construction phases (e.g. shoring, formwork)

3.5 LCA Impact Categories

The most common impact category covered by life cycle assessments is the Global Warming Potential, also referred to as the 'carbon emissions' or 'carbon footprint'. GWP is the metric for assessing the climate change impacts of greenhouse gas (GHG) emissions and is expressed in units of CO₂ equivalent (CO₂e). Other common environmental impact categories are ozone depletion, acidification, eutrophication, and smog formation.

The LCA methodology also supports other environmental indicators which describe the use of resources and energy. Those are more typically expressed as kilograms of material, or megajoules in case of energy.

The BREEAM Mat 01 template, as per OneClick LCA apart for GWP, considers other environmental indicators as described in Table 6.

Table 6: Description of environmental indicators considered.

Impact category	Unit(s)	Description
Global warming potential (GWP)	kgCO ₂ eq	Describes changes in local, regional, or global surface temperatures caused by an increased concentration of greenhouse gases in the atmosphere. Greenhouse gas emissions from fossil fuel burning is strongly correlated with acidification & smog. Called "carbon footprint".
Acidification potential (AP)	kgSO ₂ eq	Describes the acidifying effect of substances in the environment. Substances such as carbon dioxide dissolve readily in water, increasing the acidity and leading to damage to water ecosystems.
Eutrophication potential (EP)	kgPO ₄ -eq	Describes the effect of adding mineral nutrients to soil or water, which causes certain species to dominate an ecosystem, compromising the survival of other species and sometimes resulting in die-off of entire animal populations.
Ozone depletion potential (ODP)	kgCFC ₁₁ eq	Describes the effect of substances in the atmosphere to degrade the ozone layer, which absorbs and prevents harmful solar UV rays from reaching Earth's surface.
Formation of ozone of lower atmosphere ("tropospheric") (POCP)	kgC ₂ H ₄ eq	Describes the effect of substances in the atmosphere to create photochemical smog. Also known as summer smog.
Non-hazardous waste disposed (NHWD)	kg	The amount of waste disposed that is arising from product raw material extraction, manufacturing and supply processes as well as end of life processing

3.6 Design Information Sources

The assessment has utilised multiple data sources and is based on the level of detail available at the current design stage. Material specifications and quantities at Concept Design stage have been assessed based on the following data received from the wider design team (Table 7).

Table 7 : Sources of design information used for LCA.

Source List	Design Information	Sender	Received	File name
1	Structural details	SimpsonHaugh	17/10/23	10474-AJP-ZZ-RF-DR-S-0600_MATERIAL SCHEDULE .pdf
2	Material quantities for substructure, superstructure, finishes, services and external works	Downing	18/10/23	FS, Block C Cost Plan Nr 1 - DRAFT CARBON.xlsx
3	Façade details	SimpsonHaugh	18/10/23	Information provided via email

5	Project background information	SimpsonHaugh	20/09/23	<i>First Street south – building C, design team meeting.pdf</i>
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The relevant data was summarised in the Life Cycle Inventory (LCI) spreadsheet issued by Ramboll UK Limited, with any assumptions made regarding specifications and other details communicated back to the design team to create the most accurate LCA model possible at this early stage. The LCI sheet is included in Appendix 1.

3.7 LCA Data sources and assumptions

The One Click LCA 'LCA for BREEAM UK' tool includes a large database of Environmental Product Declarations (EPDs) and generic material data. Environmental Product Declarations (EPDs) are documents that quantify the environmental impacts of materials or products. According to the RICS professional statement '*Whole life carbon assessment for the built environment, November 2017*' the following data sources are allowable for use in whole life carbon assessments:

- Type III environmental declarations (EPDs and equivalent) in accordance with EN 15804, ISO 21930, ISO 14067, PAS 2050.
- EPDs in accordance with ISO 14025, 14040 and 14044.
- Where there is no specific qualifying carbon data for items included in the assessment, then allowable carbon information available for equivalent or closely similar products, that complies with the above requirements, should be used. The most recent geographically and technologically appropriate data should be selected depending on project location and subject to anticipated supply chains.

According to Mat01 requirements, elemental construction quantities at the Concept Design stage are required to be input as +/-10% of quantities shown in design documents. During Concept Design stage generic or manufacturer-specific data can be used, using the closest matching data in the tool. Regarding product quantities, typical or generic values (non-project specific elemental constructions) may be used, where data is not available.

Where possible EPDs for equivalent or closely similar products have been used to extract the material embodied carbon emissions, as these represent the most accurate source of information. All EPD and generic data used in the LCA analysis comply with the EN 15804 requirements and is drawn from the OneClick LCA database, which has been approved following the BRE-verified data qualification methodology by LCA data specialists.

A detailed list of the environmental data sources used for this assessment is presented in Appendix 2. Table 8 below summarises the main project data sources and key assumptions, where data was not available.

Table 8: Main project data sources and key assumptions.

Life cycle stage	Data sources and assumptions
A1 – A3 Construction materials	<p>Material quantities and material description provided by design team as noted in Table 7 above.</p> <p>Where details on the material specification were not provided, the default specifications included within the RICS guidance '<i>Whole life carbon assessment for the built environment, November 2017</i>', Table 6 have been used.</p>
A4 Transportation to site	<p>Carbon emissions: As per Table 7 of the RICS '<i>Whole life carbon assessment for the built environment, November 2017</i>' guidance, average rigid HGV with average laden as per BEIS carbon conversion factors, 0.21 kgCO₂e/tonne.km.</p> <p>Transport scenarios: Typically, as per OneClick LCA defaults, or as per Table 7 of the RICS '<i>Whole life carbon assessment for the built environment, November 2017</i>' guidance.</p>
A5 Construction and installation process	<p>Impacts are based on conservative default values provided within the OneClick LCA database, using the construction site scenarios tool and selecting the 'Average site impacts – temperate climate (North)' scenario with rates based on emissions per m² of GIA.</p> <p>A5 emissions are broken down into two subsets (A5a & A5w). A5a emissions are due to general construction site activities and A5w emissions are associated with the volume of each material that is wasted on site during the construction process. Reporting A5w emissions is not possible within the building LCA tool thus are excluded from this analysis.</p>
B1 – B5 Maintenance, Repair, Replacement	<p>OneClick LCA 'Technical Service Life' values.</p> <p>Component lifespans as per Table 9 of the RICS '<i>Whole life carbon assessment for the built environment, November 2017</i>' guidance.</p> <p>Material maintenance and repair activities have not been included in the scope; materials have been assumed to be replaced in their entirety at the end of their service life.</p>
B6 Operational energy use	Not required for compliance with BREEAM UK 2018, Mat01 requirements
B7 Operational water use	Not required for compliance with BREEAM UK 2018, Mat01 requirements
C1 – C4 End of Life stage	Data from EPDs used and default values from OneClick LCA database, which represent the typical end of life processing for material types in compliance with the requirements of the EN 15804+A1.
D Benefits and loads beyond the system boundary	Not required for compliance with BREEAM UK 2018, Mat01 requirements

4. BREEAM MAT01 OPTIONS APPRAISAL

An options appraisal investigating lifecycle impacts associated with different design choices has been undertaken in line with the BREEAM UK NC 2018 Mat01 requirements and the BREEAM targets for the project. Four different Superstructure options for Block C have been analysed.

The sections below outline the baseline building specification, as well as the different superstructure options assessed.

4.1 Superstructure – Baseline – Option 1

The Superstructure Baseline Option is included as the 1st Option in the Mat01 Results Submission tool. The subsequent alternative designs explored form the 2nd, 3rd, and 4th options.

The preferred Superstructure option is the RC concrete frame, concrete flat slab upper floors and concrete roof parapets. The external wall is formed of a unitised curtain walling system, glass fronted with an aluminium frame. Internal walls are mixed SFS partitions.



Figure 6: Block C First Street , Option 1 -Baseline embodied carbon breakdown per building element type (A-C).

Figure 6 shows that the top three carbon hotspots for Option 1 – Baseline are: external envelope (~36% of the overall carbon), the concrete upper floors (~26% of the overall carbon), and the concrete frame (~15% of the overall carbon).

Figure 7 details the most split of carbon emission by the most common material types (A1-A5 emission only). As the scope covers only the structural elements, concrete accounts for the majority of emissions due to the frame and floors. Despite being a much lower tonnage, steel reinforcing bars account for a further 11% of emissions due to the high carbon intensity of steel. Glass and glazing components in the façade are also a significant contributor, around 20% of total emissions.

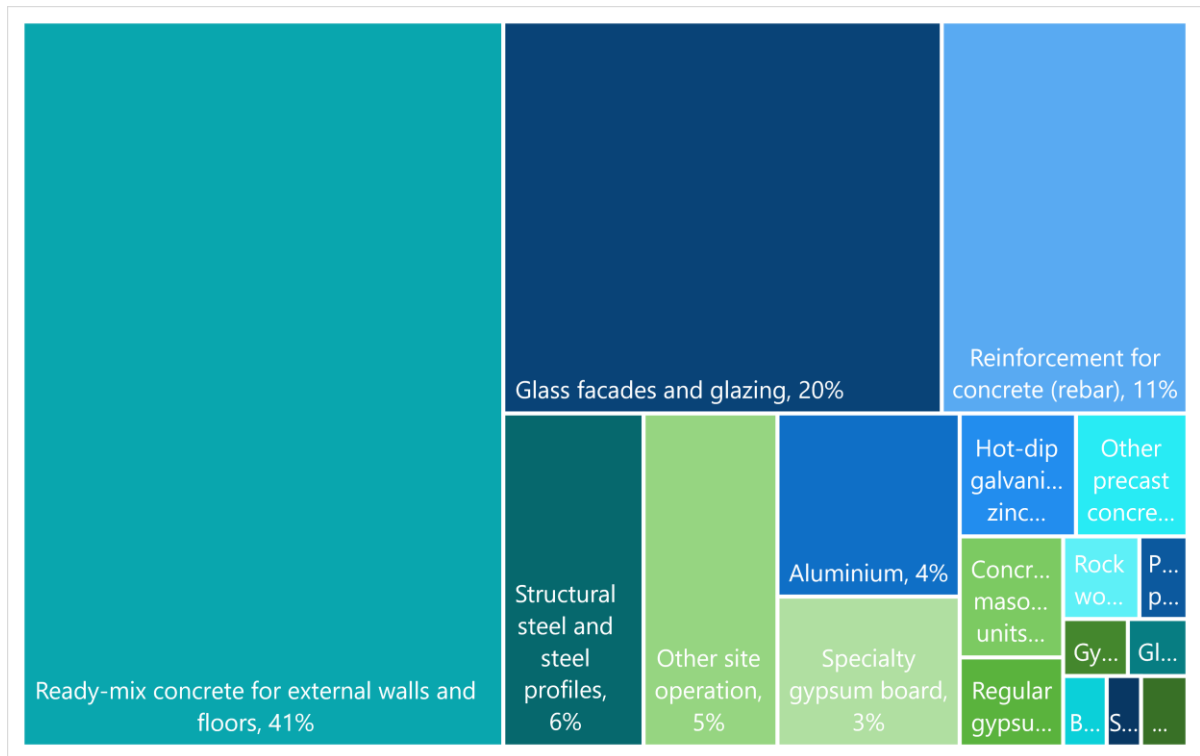


Figure 7: Block C First Street – Superstructure embodied carbon breakdown by materials (A1-A5) for Option 1 - Baseline

4.2 Superstructure – Options Appraisal

In addition to the baseline, the following alternative Superstructure options have been identified to be further assessed in terms of their embodied carbon performance. All options identified below result in significant differences in the material specifications, their associated embodied carbon emissions, and the required material quantities. Table 9 presents the different superstructure options assessed and their impact on the overall embodied carbon emissions.

Table 9: Block C First Street, Superstructure options appraisal summary.

Changes to baseline shown in green

Options Appraisal	Superstructure	Embodied carbon (kgCO ₂ e/m ² of GIA)
Opt. 1 – Baseline: RC concrete	Structure <ul style="list-style-type: none"> RC concrete frame, C35/45 20%GGBS Concrete upper floors, C35/45 20%GGBS Concrete roof parapets Mixed SFS partitions Façade <ul style="list-style-type: none"> Double frame aluminium curtain wall glazing Aluminium rapid vents Concrete blocks with brick cladding Roof <ul style="list-style-type: none"> RC slab 	347
Option 2: PT concrete	Structure <ul style="list-style-type: none"> PT concrete frame, reduced columns, C35/45 20%GGBS PT slabs Concrete roof parapets Mixed SFS partitions Façade <ul style="list-style-type: none"> Double frame aluminium curtain wall glazing Aluminium rapid vents Concrete blocks with brick cladding Roof <ul style="list-style-type: none"> PT Slab 	329
Option 3: Concrete post and beam parapet	Structure <ul style="list-style-type: none"> RC concrete frame, C35/45 20%GGBS Concrete upper floors, C34/45 20%GGBS Concrete roof parapets Mixed SFS partitions Façade <ul style="list-style-type: none"> Double frame aluminium curtain wall glazing Aluminium rapid vents Concrete blocks with brick cladding Roof	346

	<ul style="list-style-type: none"> RC Slab 	
Option 4: Timber stud partitions	Structure <ul style="list-style-type: none"> RC concrete frame, C35/45 20%GGBS Concrete upper floors, C35/45 20%GGBS Concrete roof parapets Timber stud partitions Façade <ul style="list-style-type: none"> Double frame aluminium curtain wall glazing Aluminium rapid vents Concrete blocks with brick cladding Roof <ul style="list-style-type: none"> RC Slab 	337

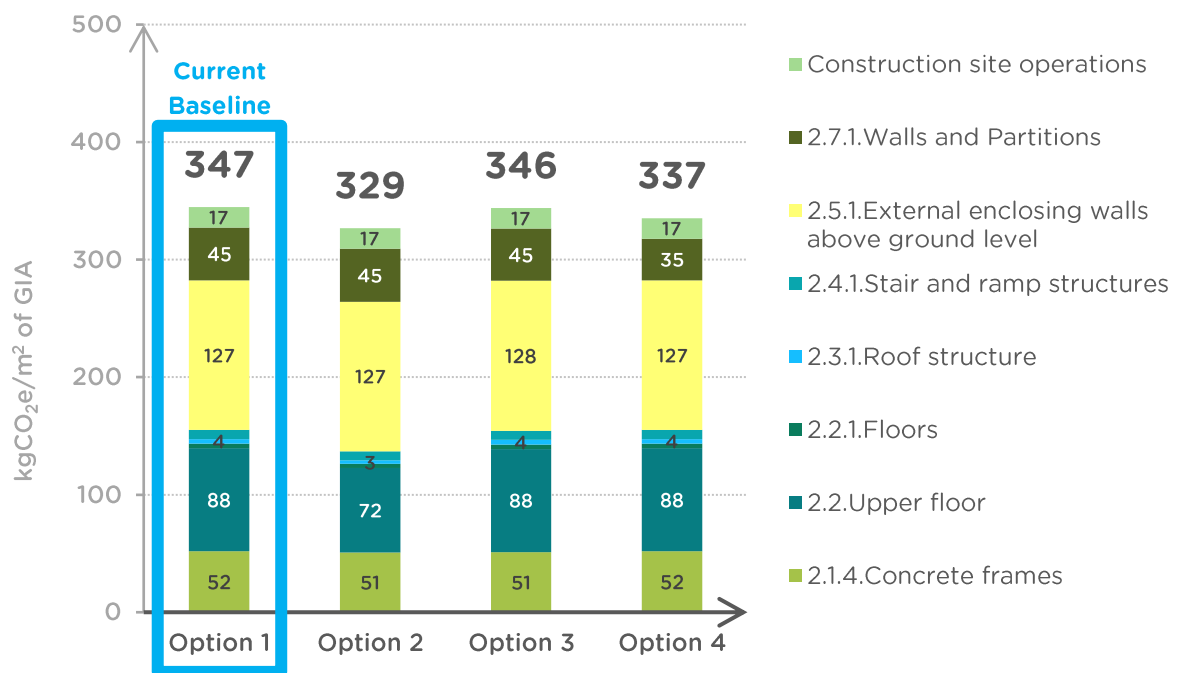


Figure 8: Block C First Street, Superstructure options results (A-C).

Superstructure results (Figure 8) indicate that Options 2 & 4 are the lowest embodied carbon options with 329 kgCO₂e/m² and 337 kgCO₂e/m² respectively, suggesting that the PT concrete slab option would be more efficient than the baseline RC option. Additionally, utilising timber internal partitions would result in a carbon reduction relative to the baseline steel studs. However, this reduction will need to be weighed up against other factors like fire and acoustic suitability. Option 3 is seen to have marginally lower carbon emissions compared to the baseline. Reducing the total concrete quantity by moving from a solid wall to a post and beam parapet with an SFS infill translates to a small (~1kgCO₂e/m²) decrease in emissions.

Stage 2 design has been completed assuming the baseline option (Option 1) has been carried forward. However, the results of the Mat 01 LCA would suggest that there could be benefit in considering a PT slab option (Option 2) to reduce carbon emissions, due to an overall reduction in the quantity of structural concrete. In addition, timber studs could be considered (Option 4) as an alternative framing material for internal partitions where feasible, pending a review of other requirements such as fire and acoustics.

Figure 9 below shows a normalised comparison of all four Superstructure options identified for all BREEAM impact categories (see section 3.5). This approach makes it possible to compare multiple environmental indicators under one graph. Between Options 1, 2 and 3 there are relatively minor differences, with combination of the RC slab and post and beam parapet (Options 3) results in the worst performance across all categories. Option 4 highlights the use of timber, as the biogenic carbon storage metric much higher, 100% improvement relative to the others where no timber is used. It is seen that there is an increase in POCP, because of the end of life for the timber where it is assumed to be incinerated, releasing emissions later in the building's lifecycle.



Figure 9. Normalised comparison of BREEAM Mat01 options for all BREEAM impact categories (GWP – Global Warming Potential, AP – Acidification Potential, EP – Eutrophication Potential, ODP – Ozone Depletion Potential, POCP – Photochemical Ozone Creation Potential, NHWD – Non-Hazardous Waste Disposed).

4.3 Opportunities for improvement

The next stages are important for making sure that the good work and decisions made at this early project stage are implemented in final design and construction. The input of the contractor will be key, as this will provide an additional layer of information with improved level of detail and access to potential suppliers for products and materials, all of which will inform the LCA process. It is highly

recommended that the LCA analysis is updated at the end of the Technical Design stage to attain the BREEAM credits.

Based on the hotspots identified in the design the following suggestions are made for reducing the embodied carbon over the development's lifetime. These can be considered for implementation at the next stages of the design and verified by the design team to confirm they satisfy other design requirements and regulations.

4.3.1 Structure

- Based on the results of the comparison, a PT option could be considered further. More detailed scheming of the option would confirm potential benefits.
- Explore a lower carbon concrete mix, working with the contractor to ensure buildability.
- Ensure steel reinforcement with high recycled content is procured (95+%)
- Utilise off-site manufacturing to reduce waste and site emissions
- Design for disassembly and consider end of life material re-use

4.3.2 Architecture

- Consider a less complicated Façade system where possible to reduce number of components and quantity of materials,
- Reduce glazing where possible to replace with opaque elements where glazing is not required
- Explore the feasibility of timber studs for internal partitions
- Specify increased recycled content in products like plasterboard

5. APPENDIX 1 - MATERIAL QUANTITIES AND SPECIFICATIONS – LCI



Life Cycle Inventory (LCI) - Sustainable Solutions Spreadsheet

Project Name:	Block C 1st Street
Project Location:	1st Street, Manchester
Project Number:	Please fill
Project Task:	Please fill
Building Typology:	Residential
Refurb or New Build:	New Build
Type of LCA:	RICS/GLA
Scope of LCA:	A1-A5, B1-B4, C1-C4, D
RIBA Stage:	RIBA 2
GIA (m²):	19,023
GFA (m²):	Please fill
NIA (m²):	Please fill - BREEAM Mat01 only
Number of bed spaces:	555
Project value (£):	

Author:	Megan Crossley, Mariami Tkeshelashvili
Checked by:	Robert Cairns
Revision:	01
Date:	01/11/2023

Definition of GIA, GFA

	GFA	GIA
Occupied Areas	Included	Included
Communal Areas (lifts, stairs, toilets (if outside user boundary))	Included	Included
Plant rooms/risers	Included	Included
External wall thickness	Included	Excluded
Non-load bearing partitions	Included	Included
Load bearing partitions	Included	Included
Columns	Included	Included
Covered rooftop plantrooms	Included	Included
Roofs no access	Excluded	Excluded
Roofs, access intended, including terraces and balconies	Included	Included
Carparks below the building	Included	Included
External car parks	Excluded	Excluded
External landscaping	Excluded	Excluded

Source List:	
OC	OneClickLCA, Generic material or product data
RICS	RICS, Whole Life Carbon Assessment for the Built Environment (2017), Table 6: Default specifications for main building materials
TM65	Embodied carbon in building services: a calculation methodology, CIBSE TM65: 2021
1	Cost Plan - updated 18.10.2023
2	Structural Engineering Drawings
3	Simpsonhaugh - façade details, email received on 23/10/23
4	Danny Sinclair - Option 1, email received 17/10/2023
5	
6	
7	
8	
9	
10	

Life-cycle stages, Adapted from EN 15978: 2011

WHOLE LIFE CARBON ASSESSMENT INFORMATION																		
PROJECT LIFE CYCLE INFORMATION														SUPPLEMENTARY INFORMATION D BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY				
A1 – A3 PRODUCT STAGE			A4 – A5 CONSTRUCTI ON PROCESS STAGE		B1 – B7 USE STAGE					C1 – C4 END OF LIFE STAGE								
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D				
RAW MATERIAL EXTRACTION AND SUPPLY	TRANSPORT TO MANUFACTURING PLANT	MANUFACTURING AND FABRICATION	TRANSPORT TO PROJECT SITE	CONSTRUCTION AND INSTALLATION PROCESS	USE	MAINTENANCE	REPAIR	REPLACEMENT	REFURBISHMENT	DECONSTRUCTION DEMOLITION	TRANSPORT TO DISPOSAL FACILITY	WASTE PROCESSING	DISPOSAL	REUSE, RECOVERY, RECYCLING POTENTIAL				
					B6 – OPERATIONAL ENERGY USE													
					B7 – OPERATIONAL WATER USE													

Table 9.2 Substructure and hard landscaping – In-scope (applicable to criteria 6 and 7)

Level 1 Group element	Level 2 Element	Level 3 Sub-element
1. Substructure	1. Substructure	1. Standard foundations 2. Specialist foundation systems 3. Lowest floor construction 4. Basement excavation 5. Basement retaining walls
8. External works*	2. Roads, paths and pavings	1. Roads, paths and pavings 2. Special surfacings and pavings
<p>*Include hard landscaping that is installed as part of the project under assessment and:</p> <ul style="list-style-type: none">• Is within a defined curtilage of the building• Or is clearly more associated with it (for example, an access road or car park that is intended to serve only the building under assessment or the building and, to a lesser extent, other buildings). <p>Hard landscaping with no such distinction shall be excluded.</p>		

QA	2.1 FRAME											
	RICS category ▼	Material Description 🔗	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
	2.1.1.Steel frames	Fire Protection & fire stopping						0	0	0	0	0
	2.1.4.Concrete frames	Parapet Wall - Podium - typical height is 1m, minimum thickness of 230mm	31	M3	1	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Parapet Wall - Podium - ; Reinforcement @ 65kg/m3	2,033	kg	1	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
	2.1.4.Concrete frames	Parapet Wall - Roof - 3.625m high, 0.2m wide	78	M3	1	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Parapet Wall - Roof - ; Reinforcement ; 65kg/m3	5,090	kg	1	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
	2.1.4.Concrete frames	Concrete Columns	579	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Concrete Columns ; Reinforcement - estimated 200kg/m3 reinforcement quantities for columns	115,754	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
	2.1.4.Concrete frames	Concrete Walls	2070	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Concrete Walls ; Reinforcement 65 kg/m3 reinforcement quantities for walls	134572	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
	2.1.4.Concrete frames	Concrete Beams	8	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Concrete Beams ; Reinforcement 230 kg/m3 reinforcement quantities for ground beams	1,917	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3

2.2 UPPER FLOORS												
	RICS category ▼	Material Description 🔗	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
	2.2.1.Floors	Insulation to underside of slab (plantroom, etc)(PROV) - average thickness of 50mm assumed	17	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))	EPD	Provide m3
	2.2.1.Floors	Insulation to underside of slab (cycle store)(PROV) - - average thickness of 50mm assumed	3	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))	EPD	Provide m3
	2.2.1.Floors	Insulation to underside of slab to prevent cold bridging (Podium) - average thickness of 50mm assumed	12	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))	EPD	Provide m3
	2.2.1.Floors	Riser flooring (incl Smoke shafts) - 30mm grating assumed	246	M2	1	Plastic	Precast Glass Fibre reinforced concrete	GRP Floor Grating, 30mm thickness	Ramboll	Polyester grating for outdoor use, 17 kg/m2, Caillebotis en polyester pour utilisation extérieure (mailles de 38mm*38mm, hauteur porteur : 30 mm) (DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFAULT)	EPD	
	2.2.Upper floor	Concrete upper floors	4419	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.2.Upper floor	Concrete upper floors ; Reinforcement 95kg/m3 reinforcement quantities for slabs	419786	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3

2.3 ROOFS												
	RICS category ▼	Material Description 🔗	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
	2.3.2.Roof coverings	Single ply roof coverings -	607	M2	1	Membrane	Single ply roofing membrane	Assumed Synthetic roofing membrane	Ramboll	Synthetic roofing membrane from FPO - PP, 1.934 kg/m2, BauderTHERMOFIN (Paul Bauder)	EPD	Provide area in m2
	2.3.2.Roof coverings	Single ply roof coverings - Podium area	242	M2	1	Membrane	Single ply roofing membrane	Assumed Synthetic roofing membrane	Ramboll	Synthetic roofing membrane from FPO - PP, 1.934 kg/m2, BauderTHERMOFIN (Paul Bauder)	EPD	Provide area in m2
	2.3.1.Roof structure	Roof slab	199	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Spec	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	
	2.3.1.Roof structure	Reinforcment to roof slab	18876.12	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	
	2.3.1.Roof structure	Capping to parapet - Podium - assumed solid concrete coping stones, 50mm x 500mm	3.40	M3	1	Concrete	Precast Concrete - C40/50, 0% GGBS (ICE), Average UK cement mix	Assumed C40/50, 0% Cement Replacement	IstructE	Ready-mix concrete, RC 40/50 (40/50 MPa), with CEM I	ICE	Provide m3
	2.3.1.Roof structure	Capping to parapet - Roof - assumed solid concrete coping stones, 50mm x 500mm	2.71	M3	1	Concrete	Precast Concrete - C40/50, 0% GGBS (ICE), Average UK cement mix	Assumed C40/50, 0% Cement Replacement	IstructE	Ready-mix concrete, RC 40/50 (40/50 MPa), with CEM I	ICE	Provide m3
	2.3.1.Roof structure	Roof Level Plantroom - Roof Assume lightweight profiled roof deck	55	M2	1	Steel	Profiled sheet for decking	Assumed profiled steel decking part of composite floc	IstructE	Profiled steel decking for composite floor slabs/decking, 0.9mm sheet thickness, 11.35kg/m2, ComFlor 80 0.9mm steel structural floor deck (Tata Steel)	EPD	Provide m2/kg/m3
	2.3.2.Roof coverings	Paving to Plant - assumes 72 kg/m2	5400	KG	1	Concrete	Precast Concrete Paving	Assumed Precast concrete	Ramboll	Precast concrete paving products, 2350 kg/m3 (BPCF)	EPD	Provide m3 or kgs, Assuming 72kg/m2 (30mm thick), 192kg/m2 (80mm thick)

2.4 STAIRS AND RAMPS												

	RICS category ▼	Material Description	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
	2.4.1.Stair and ramp structure	Precast concrete stair going 28 levels (to Roof) - a flight of stairs is approximately 3m, assume 2 flights per level	168	M	1	Concrete	Staircase - 140cm wide	Assumed Precast concrete	Ramboll	Precast concrete staircase, 10 steps, width. 140cm, 1422.6kg/m, CEM III/A, VD (SORIBA)	EPD	Provide length (m)
	2.4.1.Stair and ramp structure	Precast concrete stair going 22 levels - a flight of stairs is approximately 3m, assume 2 flights per level	162	M	1	Concrete	Staircase - 140cm wide	Assumed Precast concrete	Ramboll	Precast concrete staircase, 10 steps, width. 140cm, 1422.6kg/m, CEM III/A, VD (SORIBA)	EPD	Provide length (m)
	2.4.3.Stair and ramp balustrades and handrails	Painted Mild Steel balustrades and ancilleries	440	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
	2.4.3.Stair and ramp balustrades and handrails	Painted Mild Steel handrails and ancilleries - includes landing	715	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
	2.4.1.Stair and ramp structure	Stringers - 1.5m wide x 440mm	216	M2	1	Steel	Steel Staircase straight	Galvanised steel straight staircase	Ramboll	Galvanized steel staircase, straight, 207.21 kg/m2	EPD	Provide area in m2
	2.4.3.Stair and ramp balustrades and handrails	Handrail to Plant rooms	13	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
	2.4.1.Stair and ramp structure	Plant room steps - assume 1.5m x 3m	5	M2	1	Steel	Steel Staircase straight	Galvanised steel straight staircase	Ramboll	Galvanized steel staircase, straight, 207.21 kg/m2	EPD	Provide area in m2

2.5 EXTERNAL WALLS												
	RICS category ▼	Material Description	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
	2.5.1.External enclosing walls above ground level	Ground floor - Brickwork, area 435m², single brick cladding, 102.5mm thick	44.5875	M3	3	Clay	Clay Bricks - Façade	Assumed red brick, average production	Ramboll	Red brick, average production, UK, 215 mm x 102.5 mm x 65 mm, 2.13 kg/unit, 1485 kg/m3 (Brick Development Association (BDA) Ltd (2019))	EPD	Provide m3
	2.5.1.External enclosing walls above ground level	Ground floor - Brickwork, mortar, area 435m², assuming double brick, 205mm thick	6.688125	KG	Select	Mortar	Masonry/Bricklaying Mortar (BREEAM/LEED)	Cement based mortar for bricklaying	Ramboll	Masonry mortars (CPI Mortars Ltd)	EPD	Provide kg/ton Assuming density 1600kg/m3 - Calculating quantity Assuming 15% of brickwork (6% for blockwork) elevation area (m2) x 102.5mm (brick or block thickness)
	2.5.1.External enclosing walls above ground level	Ground floor - 140mm block substrate, area 435m²	60.9	M3	3	Concrete	Concrete block wall - Lightweight - 140mm (BREEAM/LEED)	Assumed lightweight concrete blocks	Ramboll	Lightweight concrete block, 13N, 0.35 W/mK, 1183.93 kg/m3, Thermal Liteblock (Roadstone)	EPD	Provide m3
	2.5.1.External enclosing walls above ground level	Ground floor - Curtain walling	177	M2	3	Aluminium	Curtain walls - Double glazed	Assumed curtain wall system with aluminium frame,	Ramboll	Glass facade, size: 3.6 x 7.2m, double glazing, 51.67 kg/m2, Curtain wall Concept Wall® CW 60 – CW 60 HI (Reynaers)	EPD	Provide area in m2
	Select	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner and 152mm rockwool insulation (~60%), area 8560m²	7019.2	M2	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner and 152mm rockwool insulation (~60%), area 8560m²	7019.2	M2	3	Aluminium	Curtain walls - Double glazed	Assumed curtain wall system with aluminium frame,	Ramboll	Glass facade, size: 3.6 x 7.2m, double glazing, 51.67 kg/m2, Curtain wall Concept Wall® CW 60 – CW 60 HI (Reynaers)	EPD	Provide area in m2
	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner and 152mm rockwool insulation (~60%), area 8560m²	22341.6	KG	3	Aluminium	Louvres (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)	OC	Assuming 14.5kg/m2 for louvre door/window (excl. frame), 15 horizontal items/ meter of height, 1.5mm gauge, approx. 1kg/liner meter for each item
	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner 2x12.5mm Wallboard, 48/50 'I' stud gypframe and 152mm rockwool insulation (~60%), area 8560m²	86284.8	KG	3	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner 2x12.5mm Wallboard, 48/50 'I' stud gypframe and 152mm rockwool insulation (~60%), area 8560m²	6163.2	KG	3	Steel	Metal framing components - Gypframe 48 S 50 'C' Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))	EPD	Assuming Gypframe® 48 S 50 'C' Stud 1.2kg/m2 @600mm centres (0.52kg/linear meter)
	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner, 152mm rockwool insulation (~60%), area 8560m²	780.672	M3	3	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, 33 kg/m3, Lambda=0.037 W/(m.K), FLEXI 1200x600x100 (ROCKWOOL, UK plant)	EPD	Provide m3
	2.5.1.External enclosing walls above ground level	Parged Walling, aluminium rainwaterproof cladding, 3mm thick	3111.34	M2	4	Aluminium	Cladding panels (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)	OC	Assuming 11.34kg/m2 (3mm thick), 15.12kg/m2 (4mm thick)
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.6 EXTERNAL WINDOWS												
	RICS category ▼	Material Description	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions

	2.6.2.External doors	Single door - Automated - assume 0.85m x 2.1m	5.36	M2	1	Aluminium	Glazed Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminium framed glazed doors, double glazed, per sq. meter, 83% glass, 12% aluminium, 3% steel, 40.79, AXILE Family, EDGE Family, KINETIC Family, ELITE Aero (Optima)	OC	Provide area in m2
	2.6.2.External doors	Double door - Automated - Assume 1.2m x 2.1m	2.520	M2	1	Aluminium	Glazed Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminium framed glazed doors, double glazed, per sq. meter, 83% glass, 12% aluminium, 3% steel, 40.79, AXILE Family, EDGE Family, KINETIC Family, ELITE Aero (Optima)	OC	Provide area in m2
	Select	Plenum boxes	609	UNIT								
	2.6.2.External doors	Single Doors - LV - assume 0.85m x 2.1m	1.8	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
	2.6.2.External doors	Double Doors - Plant Room, Binstore - assume 1.2m x 2.1m	13	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
	2.6.2.External doors	Single Escape External Doors - assume 0.85m x 2.1m	3	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
	2.6.1.External Windows	Louvres (rear plinth) -assumes 14.5kg/m2	290	KG	1	Aluminium	Louvres (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)	OC	Assuming 14.5kg/m2 for louvre door/window (excl. frame), 15 horizontal items/ meter of height, 1.5mm gauge, approx. 1kg/liner meter for each item
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.7 INTERNAL WALLS AND PARTITIONS												
	RICS category ▼	Material Description ?	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
1	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - SFS 100mm @ 600mm crs	10147.90	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including vertical and horizontal studs)
	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 50mm APR Insulation assumed	1922.76	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 mm, 18 kg/m3, APR1200 (Isover)	EPD	Assuming 0.9kg/m2 (50mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 12.5mm plasterboard	35891.52	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 3mm skim	8545.60	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Stud partitions; Bed/bed100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - SFS 100mm @ 600mm crs	16758.00	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including vertical and horizontal studs)
	2.7.1.Walls and Partitions	Stud partitions; Bed/bed bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 50mm APR Insulation assumed	3175.20	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 mm, 18 kg/m3, APR1200 (Isover)	EPD	Assuming 0.9kg/m2 (50mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Bed/bed bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 12.5mm plasterboard	59270.40	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Bed/bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 3mm skim	14112.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - SFS 100mm @ 600mm crs	54987.19	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including vertical and horizontal studs)
	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 50mm APR Insulation assumed	10418.63	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 mm, 18 kg/m3, APR1200 (Isover)	EPD	Assuming 0.9kg/m2 (50mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 12.5mm plasterboard	194481.00	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ water vapour resistance, Gyproc FireLine (British Gypsum (2019))	EPD	Assuming 10.55k/m² (12.5mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 3mm skim	46305.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - SFS 100m @ 600mm crs	2234.40	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including vertical and horizontal studs)
	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 50mm APR	423.36	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 mm, 18 kg/m3, APR1200 (Isover)	EPD	Assuming 0.9kg/m2 (50mm thick)
	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 12.5mm plasterboard	7902.72	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 3mm skim	1881.60	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. Assumes 0.9kg/m2	62126	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ water vapour resistance, Gyproc FireLine (British Gypsum (2019))	EPD	Assuming 10.55k/m² (12.5mm thick)

	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. Assumes 4.75kg/m2	14437	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including vertical and horizontal studs)
	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim.	304	M3	1	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, 33 kg/m3, Lambda=0.037 W/(m.K), FLEXI 1200x600x100 (ROCKWOOL, UK plant)	EPD	Provide m3
	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. Assumes 1 x 3mm as it's only on one side of the wall - assumes 2kg/m2	6079	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on s	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
assume this is included in FFE allowance	2.7.1.Walls and Partitions	Ditto in Wdw Reveals - Assume 200mm width for window surrounds, 2No. Layers of fire rated	29513	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ water vapour resistance, Gyproc FireLine (British Gypsum (2019))	EPD	Assuming 10.55k/m² (12.5mm thick)
	2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) - Assumed build up: gypframe 60 I70 @ 600mm crs, grproc coreboard 19mm between studs, 2 layers 12.5mm Fireline to non shaft side	2658.25	KG	1	Steel	Metal framing components - Gypframe 70 S 50 Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))	EPD	Assuming Gypframe® 70 S 50 AcouStud 1.4kg/m2 @600mm centres (0.61kg/linear meter)
	2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) - Assumed build up: gypframe 60 I70 @ 600mm crs, grproc coreboard 19mm between studs, 2 layers 12.5mm Fireline to non shaft side	36.08	M3	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gyproc Coreboard	Ramboll	Gypsum plasterboard, fire resistant, moisture resistant, 19 mm, 16.13 kg/m2, 849 kg/m3, fire resistance class A2-s1, d0, CoreBoard (Saint-Gobain Gyproc, Kingscourt plant)	EPD	
	2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) - Assumed build up: gypframe 60 I70 @ 600mm crs, grproc coreboard 19mm between studs, 2 layers 12.5mm Fireline to non shaft side	40063.63	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ water vapour resistance, Gyproc FireLine (British Gypsum (2019))	EPD	Assuming 10.55k/m² (12.5mm thick)
	2.7.1.Walls and Partitions	300 mm Blockwork walls; plastered one sides - assumes the thickness of a concrete wall is 8 inches (0.2032 meters)	94	M3	1	Concrete	Concrete block wall - Lightweight - 140mm (BREEAM/LEED)	Assumed lightweight concrete blocks	Ramboll	Lightweight concrete block, 13N, 0.35 W/mK, 1183.93 kg/m3, Thermal Liteblock (Roadstone)	EPD	Provide m3
	2.7.1.Walls and Partitions	300 mm Blockwork walls; plastered one sides - plasterd one side	629.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on s	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Dry lining to pods - assumes 10kg/m2	46620	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/12.5 mm, 800 kg/m3, 10µ water resistance, Glasroc H TILEBACKER (British Gypsum)	EPD	Assuming 10kg/m2 (12.5mm thick)
	2.7.1.Walls and Partitions	Dry lining/ Plaster to Core Walls (including cleaners cupboards) - assumes 10kg/m2	101745	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/12.5 mm, 800 kg	EPD	Assuming 10kg/m2 (12.5mm thick)
	2.7.1.Walls and Partitions	Stud Patyition to management area - 2No. 12.5mm plasterboard, 70mm stud @ 600mm crs, 3mm plaster skim both sides	391	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.7.1.Walls and Partitions	Stud Patyition to management area - 2No. 12.5mm plasterboard, 70mm stud @ 600mm crs, 3mm plaster skim both sides	65	KG	2	Steel	Metal framing components - Gypframe 70 S 50 Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))	EPD	Assuming Gypframe® 70 S 50 AcouStud 1.4kg/m2 @600mm centres (0.61kg/linear meter)
	2.7.1.Walls and Partitions	Stud Patyition to management area - 2No. 12.5mm plasterboard, 70mm stud @ 600mm crs, 3mm plaster skim both sides	93	KG	3	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on s	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Rockwool to pods - 50mm of rockwool	83	M3	1	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, 33 kg/m3, Lambda=0.037 W/(m.K), FLEXI 1200x600x100 (ROCKWOOL, UK plant)	EPD	Provide m3
	2.7.1.Walls and Partitions	Cluster Cupboards - assumes 900mm x 600mm x 600mm, assumes density 500kg/ m3										
	2.7.1.Walls and Partitions	Fire resistant to pod riser and void above		UNIT	1	Select	Select					
	2.7.1.Walls and Partitions	Glazed screen to stairs/reception at Ground Floor (Provisional)	12	M2	1	Aluminium	Glazed Partitions	Assumed double-glazed aluminium frame partitions	Ramboll	Aluminium framed glazed partition systems, double glazed, per m2, 90% glass, 9% aluminium, width 3.0m; height 2.70m, glazing thickness 12mm, Optima 117, 217, Revolution 54,100, Kinetic, Technishield (Optima)	EPD	Provide area in m2
	2.7.1.Walls and Partitions	EO for single doors - glazed, sliding automatic, access control	36	M2	1	Aluminium	Glazed Sliding Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminum frame sliding door, size: 1.23 x 2.18m, double glazing, 27.87 kg/m2, SlimLine 38 Door (Reynaers)	OC	Provide area in m2
To ask about the RICS guidance for these - to exclude, contingency factor at the end	Select	Pattressing to entrance doors (PAS 24)- 18mm Selex ply to surround of door opening		UNIT	1	Timber	Select					
	Select	3 sided letterbox to head of entrances		UNIT	1	Timber	Select					
	Select	Boxing in detail - cill		M	1	Timber	Select					
	Select	Blind boxes		M	1	Plasterboard	Select					
	Select	Plenum boxes		UNIT	1	Steel	Galvanised profiled sheet					
	Select			Select	Select	Select	Select					

2.8 INTERNAL DOORS												
RICS category ▼	Material Description	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions	

Less than 1% of the cost of that element category, then it would be okay to excl. negli	2.8.Internal Doors	Single Doorset - cluster bedroom; pre-finished laminate doors including all ironmongery; acoustic seal - assume 0.85m x 2.1m, 241No.	430	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	EO for accessible bedroom door ironmongery, allow 0.2kg/doorset	5	KG	1	Steel	Stainless steel	Assumed stainless steel sheets or plates	Ramboll	Stainless steel sheets or plates, 7900 kg/m3 (Outokumpu Oyj)	EPD	Provide kg or m3
	2.8.Internal Doors	Single Doorset - cluster Entrance; pre-finished laminate oors including all ironmongery - assume 0.85 x 2.1m, 43No.	95	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	EO for accessible cluster entrance door ironmongery, allow 0.2kg/doorset	5	KG	1	Steel	Stainless steel	Assumed stainless steel sheets or plates	Ramboll	Stainless steel sheets or plates, 7900 kg/m3 (Outokumpu Oyj)	EPD	Provide kg or m3
	2.8.Internal Doors	Single Doorset - to cluster kitchen/living room; pre-finished laminate doors including all ironmongery - assume 0.85 x 2.1m, 43No.	95	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Single Doorset - to studio entrance; pre-finished laminate doors including all ironmongery; acoustic seal - assume 0.85 x 2.1m, 314No.	560	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	EO for accessible cluster entrance door ironmongery, allow 0.2kg/doorset	5	KG	1	Steel	Stainless steel	Assumed stainless steel sheets or plates	Ramboll	Stainless steel sheets or plates, 7900 kg/m3 (Outokumpu Oyj)	EPD	Provide kg or m3
	2.8.Internal Doors	Pod Doors including threshold - assume 0.85 x 2.1m, 503No.	898	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Pod Doors Accessible including threshold - assume 0.85 x 2.1m, 52No.	93	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Single door - to student circulation; pre-finished; staircase FD 60 - assume 0.85 x 2.1m, 162No.	289	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Double door - to student circulation; pre-finished; staircase FD 60 - assume 1.2m x 2.1m	3	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Single door - to student circulation; pre-finished : offices,laundry, common room (PROVISIONAL) - assume 0.85 x 2.1m, 6No.	11	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Double door - to student circulation; pre-finished - Assume 1.2m x 2.1m	3	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Single door - BOH; pre-finished - assume 0.85 x 2.1m, 9No.	16	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Double door - BOH; pre-finished - Assume 1.2m x 2.1m, 7No.	35	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Single door - to cleaners/comms; pre-finished - assume 0.85 x 2.1m, 55No.	98	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Accessible WC Door - to student area; pre-finished veneer doors including all ironmongery - assume 2.1m, and the standard accessible width is 950mm. 1.98m and 0.95m	2	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1,23 m x 2,18 m, 72.8 kg/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Single Duct Access Door; paint grade (Pods) - assume 600x600m	200	M2	1	Steel	Hatch door	Assumed Coated steel hatch door	Ramboll	Coated steel hatch door, 11.67kg/m2, DONNEE PAR DEFAULT (DED)	EPD	Provide area in m2
	2.8.Internal Doors	Riser doors - Single - assume 0.85 x 2.1m	48	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
	2.8.Internal Doors	Riser doors - Double - Assume 1.2m x 2.1m	680	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
	2.8.Internal Doors	Cluster Cupboard door	95	M2	1	Timber	Timber door	Assumed interior door	Ramboll	Wooden and engineered wood interior doors, 1.23 m x 2.18 m, 72.8 ka/m2 (VHI)	EPD	Provide area in m2
	2.8.Internal Doors	Smoke Vent Doors; FD 60 - assume 0.85 x 2.1m FD60 doors	100	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
	2.8.Internal Doors	EO Entrabce Doors for PAS 24 (Provisional)										
	2.8.Internal Doors	Window boards - assumes 219mm wide and thickness of 30mm	2979	KG	1	Timber	Skirting boards	Assumed MDF generic	Ramboll	Timber, MDF	ICE	Provide kg (density 500ka/m3)
	2.8.Internal Doors	Skirtings - assumes 18mm thickness, 121mm width	17527	KG	1	Timber	Skirting boards	Assumed MDF generic	Ramboll	Timber, MDF	ICE	Provide kg (density 500ka/m3)
	2.8.Internal Doors	SAA corner protection 25 x 25 x 1150 - assumes 2.7kg/m2, 150Nr	23	KG	1	Aluminium	Sheets	General European mix - ICE	IstructE	Aluminium sheet, European Mix, Inc Imports	ICE	Assuming 1.90kg/m2 for 0.7mm thick profile, 2.7kg/m2 for 1mm thick profile
	2.8.Internal Doors	VING - Entrance and Bedroom Doors										
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

3. INTERNAL FINISHES												
RICS category ▼		Material Description [i]	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
Included based on area of partitions	3.1.Wall finishes	Tiling to kitchen areas - 4 m2 per kitchen; brick pattern	212	M2	1	Ceramics	Wall/Floor Tiles	Assumed ceramic tiles 18.65kg/m2	Ramboll	Ceramic tiles, Italian average, 10mm, 19.9 kg/m2 (Confindustria Ceramica	EPD	Provide area in m2
	3.1.Wall finishes	Painting and decorating - as RHSC -	2795.00165	KG	1	Paint	Water based - Indoor use	Indoor use	Ramboll	Paint, water-based, mid sheen finish, indoor use, 1090-1230 kg/m3, 12 m2/l, Johnstone's Trade Acrylic Durable Eggshell Base L, Base M, Base D, Base Z, Base Z2 (PPG Architectural Coatings UK (2020))	EPD	Assumed 0.097kg/m2 (0.8mm thick coat)
	3.1.Wall finishes	2 coat Plaster; staircases 2.4-2.7m hi - 3.5 floors - assuming 3mm thick	2548	KG	1	Plaster Gypsum	Interior Applications	Gypsum Plaster	Ramboll	Gypsum-based plaster, for most internal backgrounds, 94.6% gypsum, 5.4% additives, 861.5 kg/m3, Thistle Universal OneCoat (British Gypsum Saint Gobain)	EPD	2.6 kg for 3mm thick coat, 4.3kg/m2 for 5mm thick coat, 8.6kg/m2 for 10mm thick coat

	3.2.Floor finishes	Carpet Tiles; Burmatex Oska to student cluster bedrooms	3800.56	M2	1	Carpet	Carpet Tiles	Assumed carpet tiles with 50% recycled content and	Ramboll	Modular carpet tiles, tufted, 4.8 kg/m2, pile material of polyamide (PA) 6.6, max. 1.1 kg/m2, with a bitumen backing, Graphlex (Interface Europe Manufacturing BV)	EPD	Provide area in m2
	3.2.Floor finishes	Vinyl to cluster kitchen/Lounges (includes Latex) - assumes 3.25kg/m2	4431.375	KG	1	Vinyl	Flooring	Assumed vinyl flooring 2mm thick, 3.25kg/m2	Ramboll	Luxury vinyl floor tile, glue down, 0.118 in (3.0 mm), 16.43 oz/ft2 (5.015 kg/m2), Art Select (Desig	EPD	Assuming 3.25kg/m2 (2mm thick vinyl)
	3.2.Floor finishes	Carpet Tiles to studios	6874.93	M2	1	Carpet	Carpet Tiles	Assumed carpet tiles with 50% recycled content and	Ramboll	Modular carpet tiles, tufted, 4.8 kg/m2, pile material of polyamide (PA) 6.6, max. 1.1 kg/m2, with a	EPD	Provide area in m2
	3.2.Floor finishes	Carpet tiles to cluster corridor: laid to pattern	864.595	M2	1	Carpet	Carpet Tiles	Assumed carpet tiles with 50% recycled content and	Ramboll	Modular carpet tiles, tufted, 4.8 kg/m2, pile material of polyamide (PA) 6.6, max. 1.1 kg/m2, with a	EPD	Provide area in m2
	3.2.Floor finishes	Carpet tiles to student circulation	1722.88	M2	1	Carpet	Carpet Tiles	Assumed carpet tiles with 50% recycled content and	Ramboll	Modular carpet tiles, tufted, 4.8 kg/m2, pile material of polyamide (PA) 6.6, max. 1.1 kg/m2, with a	EPD	Provide area in m2
	3.2.Floor finishes	Lift Lobbies - assume floor finish, carpet tiles	338.47	M2	1	Carpet	Carpet Tiles	Assumed carpet tiles with 50% recycled content and	Ramboll	Modular carpet tiles, tufted, 4.8 kg/m2, pile material of polyamide (PA) 6.6, max. 1.1 kg/m2, with a	EPD	Provide area in m2
	3.2.Floor finishes	Carpet tiles to amenity space	448.8	M2	1	Carpet	Carpet Tiles	Assumed carpet tiles with 50% recycled content and	Ramboll	Modular carpet tiles, tufted, 4.8 kg/m2, pile material of polyamide (PA) 6.6, max. 1.1 kg/m2, with a	EPD	Provide area in m2
	3.2.Floor finishes	Carprt Tilres to Management Suite	66	M2	1	Carpet	Carpet Tiles	Assumed carpet tiles with 50% recycled content and 1100 g/m² pile weight	Ramboll	Modular carpet tiles, tufted, 4.8 kg/m2, pile material of polyamide (PA) 6.6, max. 1.1 kg/m2, with a bitumen backing, Graphlex (Interface Europe Manufacturing BV)	EPD	Provide area in m2
	3.2.Floor finishes	Vinyl to communal disabled toilets - assumes 3.25kg/m2	16.3475	KG	1	Vinyl	Flooring	Assumed vinyl flooring 2mm thick, 3.25kg/m2	Ramboll	Luxury vinyl floor tile, glue down, 0.118 in (3.0 mm), 16.43 oz/ft2 (5.015 kg/m2), Art Select (Desig	EPD	Assuming 3.25kg/m2 (2mm thick vinyl)
	3.2.Floor finishes	Vinyl to student Laundry/cleaner stores - PC Sum - assumes 3.25kg/m2	226	KG	1	Vinyl	Flooring	Assumed vinyl flooring 2mm thick, 3.25kg/m2	Ramboll	Luxury vinyl floor tile, glue down, 0.118 in (3.0 mm), 16.43 oz/ft2 (5.015 kg/m2), Art Select (Designflooring)	EPD	Assuming 3.25kg/m2 (2mm thick vinyl)
	3.2.Floor finishes	Staircase carpet - student - PC Sum	91	M2	1	Carpet	Carpet Tiles	Assumed carpet tiles with 50% recycled content and	Ramboll	Modular carpet tiles, tufted, 4.8 kg/m2, pile material of polyamide (PA) 6.6, max. 1.1 kg/m2, with a bitumen backing, Graphlex (Interface Europe Manufacturing BV)	EPD	Provide area in m2
	3.2.Floor finishes	Floor paint to staircase above level 3 - assumes 0.242kg/m2	284	KG	1	Epoxy	Epoxy floor	Assumed epoxy flooring	Ramboll	Epoxy floor covering, 2 mm, 5.188 kg/m2	EPD	Provide area in m2
	3.2.Floor finishes	Staircase stringer trimming - allow for 200mm high finish x 10mm / skirting /MDF apply 500kg/m3	440	KG	1	Timber	Skirting boards	Assumed MDF generic	Ramboll	Timber, MDF	ICE	Provide kg (density 500kg/m3)
	3.2.Floor finishes	Staircase nosings - first 3 floors only - assumes 50mm width and 1.90kg/m2	20.52	KG	1	Aluminium	Sheets	General European mix - ICE	IstructE	Aluminium sheet, European Mix, Inc Imports	ICE	Assuming 1.90kg/m2 for 0.7mm thick profile, 2.7kn/m2 for 1mm thick
	3.2.Floor finishes	Entrance Lobby - Vinyl plank (Amtico) - assumes 3.25kg/m2	244	KG	1	Vinyl	Flooring	Assumed vinyl flooring 2mm thick, 3.25kg/m2	Ramboll	Luxury vinyl floor tile, glue down, 0.118 in (3.0 mm), 16.43 oz/ft2 (5.015 kg/m2), Art Select (Desig	EPD	Assuming 3.25kg/m2 (2mm thick vinyl)
	3.2.Floor finishes	Entrance flooring to Student areas; pedimatt entrance matting - in Revolving door - assumes 3.25kg/m2	42	KG	1	Vinyl	Flooring	Assumed vinyl flooring 2mm thick, 3.25kg/m2	Ramboll	Luxury vinyl floor tile, glue down, 0.118 in (3.0 mm), 16.43 oz/ft2 (5.015 kg/m2), Art Select (Designflooring)	EPD	Assuming 3.25kg/m2 (2mm thick vinyl)
	3.2.Floor finishes	Non-slip paint to bike storage - assumes 0.242kg/m2	15	KG	1	Epoxy	Epoxy floor	Assumed epoxy flooring	Ramboll	Epoxy floor covering, 2 mm, 5.188 kg/m2	EPD	Provide area in m2
	3.2.Floor finishes	Non-slip paint to refuse areas/Plant room - assumes 0.242kg/m2	73	KG	1	Epoxy	Epoxy floor	Assumed epoxy flooring	Ramboll	Epoxy floor covering, 2 mm, 5.188 kg/m2	EPD	Provide area in m2
	3.2.Floor finishes	Reception/Management office/POST Room - assumes 3.25kg/m2	213	KG	1	Vinyl	Flooring	Assumed vinyl flooring 2mm thick, 3.25kg/m2	Ramboll	Luxury vinyl floor tile, glue down, 0.118 in (3.0 mm), 16.43 oz/ft2 (5.015 kg/m2), Art Select (Designflooring)	EPD	Assuming 3.25kg/m2 (2mm thick vinyl)
	3.3.1.Finishes to ceilings	Student bedroom ceiling; plasterboard, skim & paint - assumes 10kg/m2	106755	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	3.3.1.Finishes to ceilings	Student bedroom ceiling; plasterboard, skim & paint, area 10,675 m2, assumes 3 mm thick	27755	KG	1	Plaster Gypsum	Interior Applications	Gypsum Plaster	Ramboll	Gypsum-based plaster, for most internal backgrounds, 94.6% gypsum, 5.4% additives, 861.5 kg/m3, Thistle Universal OneCoat (British Gypsum Saint Gobain)	EPD	2.6 kg for 3mm thick coat, 4.3kg/m2 for 5mm thick coat, 8.6kg/m2 for 10mm thick coat
	3.3.1.Finishes to ceilings	Student bedroom ceiling; plasterboard, skim & paint	10675	M2	1	Paint	Vinyl matt emulsion - Walls/Ceilings	Indoor & outdoor use	Ramboll	Paint, vinyl matt emulsion, indoor and outdoor use, 1240-1360 kg/m3, 17 m2/l, Johnstone's Trade Covaplus Vinyl Matt Base L, Base M, Base D, Base Z, Base Z2 (PPG Architectural Coatings UK (2020))	EPD	Provide area in m2
	3.3.1.Finishes to ceilings	Student Communal Ceiling; plasterboard, skim & paint - assumes 10kg/m2	13635	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	3.3.1.Finishes to ceilings	Student Communal ceiling; plasterboard, skim & paint, area 1363.5 m2, assumes 3 mm thick	3545	KG	1	Plaster Gypsum	Interior Applications	Gypsum Plaster	Ramboll	Gypsum-based plaster, for most internal backgrounds, 94.6% gypsum, 5.4% additives, 861.5 kg/m3, Thistle Universal OneCoat (British Gypsum Saint Gobain)	EPD	2.6 kg for 3mm thick coat, 4.3kg/m2 for 5mm thick coat, 8.6kg/m2 for 10mm thick coat
	3.3.1.Finishes to ceilings	Student Communal ceiling; plasterboard, skim & paint	1364	M2	1	Paint	Vinyl matt emulsion - Walls/Ceilings	Indoor & outdoor use	Ramboll	Paint, vinyl matt emulsion, indoor and outdoor use, 1240-1360 kg/m3, 17 m2/l, Johnstone's Trade Covaplus Vinyl Matt Base L, Base M, Base D, Base Z, Base Z2 (PPG Architectural Coatings UK (2020))	EPD	Provide area in m2
	3.3.1.Finishes to ceilings	Student Circulation Ceiling; plasterboard, skim & paint - assumes 10kg/m2	25874.75	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/12.5 mm, 800 kg/m3, 10µ water resistance, Glasroc H TILEBACKER (British Gypsum)	EPD	Assuming 10kg/m2 (12.5mm thick)
	3.3.1.Finishes to ceilings	Student circulation ceiling; plasterboard, skim & paint, area 2587.475 m2, assumes 3 mm thick	6727	KG	1	Plaster Gypsum	Interior Applications	Gypsum Plaster	Ramboll	Gypsum-based plaster, for most internal backgrounds, 94.6% gypsum, 5.4% additives, 861.5 kg/m3, Thistle Universal OneCoat (British Gypsum Saint Gobain)	EPD	2.6 kg for 3mm thick coat, 4.3kg/m2 for 5mm thick coat, 8.6kg/m2 for 10mm thick coat
	3.3.1.Finishes to ceilings	Student circulation ceiling; plasterboard, skim & paint	2587	M2	1	Paint	Vinyl matt emulsion - Walls/Ceilings	Indoor & outdoor use	Ramboll	Paint, vinyl matt emulsion, indoor and outdoor use, 1240-1360 kg/m3, 17 m2/l, Johnstone's Trade Covaplus Vinyl Matt Base L, Base M, Base D, Base Z, Base Z2 (PPG Architectural Coatings UK (2020))	EPD	Provide area in m2
	3.3.1.Finishes to ceilings	Student Staircase Ceiling; painted exposed concrete soffit - assumes 0.242kg/m2	14.68456	KG	1	Paint	Concrete sealant	Assumed coating for concrete elements	Ramboll	Concrete sealant, generic, silicone/siloxane solution	OC	Provide kg/ton
	3.3.1.Finishes to ceilings	Student Entrance Ceiling; plasterboard, skim & paint - assumes 10kg/m2	751.8	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapo	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	3.3.1.Finishes to ceilings	Student entrance ceiling; plasterboard, skim & paint, area 2587.475 m2, assumes 3 mm thick	195	KG	1	Plaster Gypsum	Interior Applications	Gypsum Plaster	Ramboll	Gypsum-based plaster, for most internal backgrounds, 94.6% gypsum, 5.4% additives, 861.5 kg/m:	EPD	2.6 kg for 3mm thick coat, 4.3kg/m2 for 5mm thick coat, 8.6kg/m2 for 10mm thick coat
	3.3.1.Finishes to ceilings	Student entranceceiling; plasterboard, skim & paint	75	M2	1	Paint	Vinyl matt emulsion - Walls/Ceilings	Indoor & outdoor use	Ramboll	Paint, vinyl matt emulsion, indoor and outdoor use, 1240-1360 kg/m3, 17 m2/l, Johnstone's Trade C	EPD	Provide area in m2
	3.3.1.Finishes to ceilings	Ceiling to student Laundry/cleaner stores/disabled Wc's - assumes 0.242kg/m2	18.06046	KG	1	Paint	Acrylic emulsion - Indoor/Outdoor use	External/Internal application	Ramboll	Paint, acrylic emulsion, indoor and outdoor use, 12 m2/l, Johnstones Acrylic Durable Matt (PPG)	EPD	Assumed 0.242kg/m2 for 2 coats (0.167mm thick coat)
	3.3.1.Finishes to ceilings	Refuse Area/LV Room Ceiling - Painted Soffit - assumes 0.242kg/m2	72.634364	KG	1	Paint	Acrylic emulsion - Indoor/Outdoor use	External/Internal application	Ramboll	Paint, acrylic emulsion, indoor and outdoor use, 12 m2/l, Johnstones Acrylic Durable Matt (PPG)	EPD	Assumed 0.242kg/m2 for 2 coats (0.167mm thick coat)
	3.3.1.Finishes to ceilings	Ceiling to Bike Store; 1nr layer 136mm Rockwool High Impact Soffit Slab fixed to underside of soffit - assumes 50mm of rockwool	3	M3	1	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, 33 kg/m3, Lamt	EPD	Provide m3
	3.3.1.Finishes to ceilings	Ceiling to Amenity Space, Reception area - possible Acoustic - 6.4kg/m2	2586	KG	1	Insulation	Acoustic baffles	Assumed Rock Wool	Ramboll	Frameless acoustic baffles, 50mm, 6.4kg/m2, 128kg/m3, Contour (ROCKWOOL FRANCE)	EPD	Assuming 6.4kg/m2 (50mm thick)
	3.3.1.Finishes to ceilings	Allowance for forming ceiling bulkheads: ne 300 wide - 300mm wide, 1207m, assumes 10kg/m2	3621	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/12.5 mm, 800 kg	EPD	Assuming 10kg/m2 (12.5mm thick)

	3.3.1.Finishes to ceilings	Access hatches to bulkheads: 600 x 600 non fire rated; tamper proof lock MDF Panel - 600 x 600 x 18mm *(367) - 500 kg/m3	1189	KG	1	Timber	Skirting boards	Assumed MDF generic	Ramboll	Timber, MDF	ICE	Provide kg (density 500kg/m3)
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.1 FRAME												
	RICS category ▼	Material Description ?	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
55.43	2.1.1.Steel frames	Fire Protection & fire stopping						0	0	0	0	0
	2.1.4.Concrete frames	Parapet Wall - Podium - typical height is 1m, minimum thickness of 230mm	31	M3	1	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Parapet Wall - Podium - ; Reinforcement @ 65kg/m3	2,033	kg	1	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recvcd steel (UK Cares (2020))	EPD	Provide kg/m3
	2.1.4.Concrete frames	Parapet Wall - Roof - 3.625m high, 0.2m wide	78	M3	1	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Parapet Wall - Roof - ; Reinforcement 65kg/m3	5,090	kg	1	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recvcd steel (UK Cares (2020))	EPD	Provide kg/m3
	2.1.4.Concrete frames	Concrete Columns - Reduction of 40m3	539	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Concrete Columns - Reinforcement - increased 200kg/m3 reinforcement quantities for columns	107,754	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
	2.1.4.Concrete frames	Concrete Walls	2070	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Concrete Walls ; Reinforcement 65 kg/m3 reinforcement quantities for walls	134572	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
	2.1.4.Concrete frames	Concrete Beams	8	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
	2.1.4.Concrete frames	Concrete Beams ; Reinforcement 230 kg/m3 reinforcement quantities for ground beams	1917	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.2 UPPER FLOORS												
total slab		4257										
RICS category ▼	Material Description ?	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions	
2.2.Upper floor	250dp R.C. SLAB	17	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3	
2.2.Upper floor	250dp R.C. SLAB ; Reinforcement Reinforcement 95kg/m3 reinforcement quantities for slabs	1622	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3	
2.2.Upper floor	150dp R.C. SLAB	6	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3	
2.2.Upper floor	150dp R.C. SLAB; Reinforcement Reinforcement 95kg/m3 reinforcement quantities for slabs	577	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3	
2.2.Upper floor	250dp SUSPENDE R.C. SLAB	151	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3	
2.2.Upper floor	250dp SUSPENDE R.C. SLAB ; Reinforcement Reinforcement 95kg/m3 reinforcement quantities for slabs	14358	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))			
2.2.Upper floor	350dp SUSPENDE R.C. SLAB	79	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)			
2.2.Upper floor	350dp SUSPENDE R.C. SLAB; Reinforcement Reinforcement 95kg/m3 reinforcement quantities for slabs	7489	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))			
2.2.Upper floor	225mm RC LANDING SLAB	159	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)			
2.2.Upper floor	225mm RC LANDING SLAB; Reinforcement Reinforcement 95kg/m3 reinforcement quantities for slabs	15114	KG	2	Steel	Reinforcement bars						
250	2.2.Upper floor	225mm PT SLAB	3747	M3	4	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	RE: First Street Block C - Carbon Workshop				
	2.2.Upper floor	225mm PT SLAB; A252 mesh top	65775	KG	2	Steel	Mesh reinforcement A252	DS Danny Sinclair <dannysinclair@ajpltd.co.uk> To Robert Cairns Cc Megan Crossley, Mariami Tkeshelashvili, McCann, Kelly, Sarah Ord Confidential Follow up. Start by 03 November 2023. Due by 03 November 2023.				
	2.2.Upper floor	225 PT SLAB; 3No PT Strands at 1200mm CTS, assume $f_p = 1000\text{mm}^2$, $f_{pk} = 1860\text{N/mm}^2$; 1.3m x 5.000130m2 / m x 4m = 8.000260m3 / m3	32679.55	KG	Ramboll	Steel	Reinforcement bars	Hi Robert Please see the quantities for the PT slab option and alternative parapet below:- 1 - PT slab could omit 8 piles, two pile caps and 2 columns - The concrete saving (not including piles) would be approximately 25m3 for the pile caps & 40m3 for the columns.				
	2.2.Upper floor	350dp R.C. SLAB	96	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	2 - There is an option that the PT slab could be reduced in depth by 25mm, this would save approximately 375m3 of concrete for the slabs L2-L27. 3 - If the parapet was changed to post and beam option this would save approximately 40m3 of concrete. In terms of infill, I would suggest that SFS will be required to fix the inner leaf of façade too. 4 - The PT slab would be a contractors designed element but I would expect A252 mesh in the top and 3No. PT strands at 1200mm cts across the slab.				
	2.2.Upper floor	350dp R.C. SLAB; Reinforcement Reinforcement 95kg/m3 reinforcement quantities for slabs	9116	KG	2	Steel	Reinforcement bars	Regards				
	2.2.Upper floor	300dp PRECAST LID	2	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)					

RE: First Street Block C - Carbon Workshop

DS Danny Sinclair <dannysinclair@ajpltd.co.uk>
To Robert Cairns
Cc Megan Crossley; Mariami Tkeshelashvili; McCann, Kelly; Sarah Ord

Confidential
Follow up. Start by 03 November 2023. Due by 03 November 2023.

Hi Robert

Please see the quantities for the PT slab option and alternative parapet below:-

1 - PT slab could omit 8 piles, two pile caps and 2 columns - The concrete saving (not including piles) would be approximately 25m3 for the pile caps & 40m3 for the columns.

2 - There is an option that the PT slab could be reduced in depth by 25mm, this would save approximately 375m3 of concrete for the slabs L2-L27.

3 - If the parapet was changed to post and beam option this would save approximately 40m3 of concrete. In terms of infill, I would suggest that SF5 will be required to fix the inner leaf of façade too.

4 - The PT slab would be a contractors designed element but I would expect A252 mesh in the top and 3No. PT strands at 1200mm cts across the slab.

Regards

Design assumptions

Supported by – Beams. Refer to beam charts and data to estimate sizes
Fire and durability – Fire resistance 1 hour; exposure class XC2, XC3, XC3
37 mm cover to ducts.

Design basis – To Concrete Society Technical Report 43^[22]. Transfer at :
prestress (P/A) = 1.5 MPa, but limited by stresses at transfer and deflect
restraint to movement. $w_{max} = 0.2\text{ mm}$.

Loads – A superimposed dead load (SDL) of 1.50 kN/m² (for finishes, s
 ψ_2 factors – For 2.5 kN/m², $\psi_2 = 0.3$; for 5.0 kN/m², $\psi_2 = 0.6$; for 7.
10.0 kN/m², $\psi_2 = 0.8$.

Concrete – C32/40 25 kN/m³; 20 mm aggregate. $f_{ck(t)}$ at transfer =
mm Superstrand ($A_{ps} = 100\text{ mm}^2$, $f_{pk} = 1860$
width.

00 MPa. Diameters as required. Main reinforcement in T1 and B1. Additional reinforcement at a

Assuming A252 square
mesh fabric 3.95 kg/m2
of area

Provide kg/m3

Provide m3

Provide kg/m3

Provide m3

2.2.Upper floor	300dp PRECAST LID;Reinforcement Reinforcement 95kg/m3 reinforcement quantities for slabs	229	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
2.2.1.Floors	Insulation to underside of slab (plantroom, etc)(PROV) - average	17	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))	EPD	Provide m3
2.2.1.Floors	Insulation to underside of slab (cycle store)(PROV) - - average thickness of	3	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))	EPD	Provide m3
2.2.1.Floors	Insulation to underside of slab to prevent cold bridging (Podium) -	12	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))	EPD	Provide m3
2.2.1.Floors	Riser flooring (incl Smoke shafts) - 30mm grating assumed	246	M2	1	Plastic	Precast Glass Fibre reinforced concrete	GRP Floor Grating, 30mm thickness	Ramboll	Polyester grating for outdoor use, 17 kg/m2, Caillebotis en polyester pour utilisation extérieure (mailles de 38mm*38mm, hauteur porteur : 30 mm)	EPD	
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.3 ROOFS											
RICS category ▼	Material Description @	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.3.2.Roof coverings	Single ply roof coverings -	607	M2	1	Membrane	Single ply roofing membrane	Assumed Synthetic roofing membrane	Ramboll	Synthetic roofing membrane from FPO - PP, 1.934 kg/m2, BauderTHERMOFIN (Paul	EPD	Provide area in m2
2.3.2.Roof coverings	Single ply roof coverings - Podium area -	242	M2	1	Membrane	Single ply roofing membrane	Assumed Synthetic roofing membrane	Ramboll	Synthetic roofing membrane from FPO - PP, 1.934 kg/m2, BauderTHERMOFIN (Paul	EPD	Provide area in m2
2.3.1.Roof structure	Roof slab - 220mm PT	156	M3	4	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Spec	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II, OC		Provide m3
2.3.1.Roof structure	320mm PT SLAB, A252 mesh top	2733	KG	4	Steel	Mesh reinforcement A252	Assumed reinforcement support for concrete (UK)	Ramboll	Carbon steel reinforcing bar (secondary production route - scrap), 7850 kg/m3, 96% EPD		Assuming A252 square mesh fabric 3.95 kg/m2 of area
2.3.1.Roof structure	C35 PT SLAB, 300 PT Stencils at 1200mm C/S, assume 1g = 100mm2, = 3000mm2 / 1.3m = 2.000230m2/m x 1mm = 2.000230m2/m2	1358.05	KG	4	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route - scrap), 7850 kg/m3, 96% EPD		Provide kg/m3
2.3.1.Roof structure	Capping to parapet - Podium - assumed solid concrete coping stones, 50mm x 500mm	3.40	M3	1	Concrete	Precast Concrete - C40/50, 0% GGBS (ICE), Average UK cement mix	Assumed C40/50, 0% Cement Replacement	IstructE	Ready-mix concrete, RC 40/50 (40/50 MPa), with CEM I	ICE	Provide m3
2.3.1.Roof structure	Capping to parapet - Roof - assumed solid concrete coping stones, 50mm x 500mm	2.71	M3	1	Concrete	Precast Concrete - C40/50, 0% GGBS (ICE), Average UK cement mix	Assumed C40/50, 0% Cement Replacement	IstructE	Ready-mix concrete, RC 40/50 (40/50 MPa), with CEM I	ICE	Provide m3
2.3.1.Roof structure	Roof Level Plantroom - Roof Assume lightweight profiled roof deck	55	M2	1	Steel	Profiled sheet for decking	Assumed profiled steel decking part of composite floc	IstructE	Profiled steel decking for composite floor slabs/decking, 0.9mm sheet thickness, 11.1	EPD	Provide m2/kg/m3
2.3.2.Roof coverings	Paving to Plant - assumes 72 kg/m2	5400	KG	1	Concrete	Precast Concrete Paving	Assumed Precast concrete	Ramboll	Precast concrete paving products, 2350 kg/m3 (BPCF)	EPD	Provide m3 or kgs, Assuming 72kg/m2 (30mm thick), 192kg/m2 (80mm thick)
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.4 STAIRS AND RAMPS											
RICS category ▼	Material Description ?	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.4.1.Stair and ramp structure	Precast concrete stair going 28 levels (to Roof) - a flight of stairs is	168	M	1	Concrete	Staircase - 140cm wide	Assumed Precast concrete	Ramboll	Precast concrete staircase, 10 steps, width. 140cm, 1422.6kg/m, CEM III/A, VD (SORIBA)	EPD	Provide length (m)
2.4.1.Stair and ramp structure	Precast concrete stair going 22 levels - a flight of stairs is approximately 3m,	162	M	1	Concrete	Staircase - 140cm wide	Assumed Precast concrete	Ramboll	Precast concrete staircase, 10 steps, width. 140cm, 1422.6kg/m, CEM III/A, VD (SORIBA)	EPD	Provide length (m)
2.4.3.Stair and ramp balustrades and ancilleries	Painted Mild Steel balustrades and ancilleries	440	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
2.4.3.Stair and ramp balustrades and ancilleries	Painted Mild Steel handrails and ancilleries - includes landing	715	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
2.4.1.Stair and ramp structure	Stringers - 1.5m wide x 440mm	216	M2	1	Steel	Steel Staircase straight	Galvanised steel straight staircase	Ramboll	Galvanized steel staircase, straight, 207.21 kg/m2	EPD	Provide area in m2
2.4.3.Stair and ramp balustrades and	Handrail to Plant rooms	13	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
2.4.1.Stair and ramp structure	Plant room steps - assume 1.5m x 3m	5	M2	1	Steel	Steel Staircase straight	Galvanised steel straight staircase	Ramboll	Galvanized steel staircase, straight, 207.21 kg/m2	EPD	Provide area in m2
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.5 EXTERNAL WALLS											
RICS category ▼	Material Description ?	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.5.1.External enclosing walls above ground level	Ground floor - Brickwork, area 435m², single brick cladding, 102.5mm thick	44.5875	M3	3	Clay	Clay Bricks - Façade	Assumed red brick, average production	Ramboll	Red brick, average production, UK, 215 mm x 102.5 mm x 65 mm, 2.13 kg/unit, 1485 kg/m3 (Brick Development Association (BDA) Ltd (2019))	EPD	Provide m3
2.5.1.External enclosing walls above ground level	Ground floor - Brickwork, mortar, area 435m², assuming double brick, 205mm thick	6.688125	KG	Select	Mortar	Masonry/Bricklaying Mortar (BREEAM/LEED)	Cement based mortar for bricklaying	Ramboll	Masonry mortars (CPI Mortars Ltd)	EPD	Provide kg/ton Assuming density 1600kg/m3 - Calculating quantity Assuming 15% of brickwork (6% for blockwork) elevation area (m2) x 102.5mm (brick or block thickness)
2.5.1.External enclosing walls	Ground floor - 140mm block substrate, area 435m²	60.9	M3	3	Concrete	Concrete block wall - Lightweight - 140mm (BREEAM/LEED)	Assumed lightweight concrete blocks	Ramboll	Lightweight concrete block, 13N, 0.35 W/mK, 1183.93 kg/m3, Thermal Liteblock (Roadstone)	EPD	Provide m3
2.5.1.External enclosing walls	Ground floor - Curtain walling	177	M2	3	Aluminium	Curtain walls - Double glazed	Assumed curtain wall system with aluminium frame,	Ramboll	Glass facade, size: 3.6 x 7.2m, double glazing, 51.67 kg/m2, Curtain wall Concept Wall® CW 60 – CW 60 HI (Reynaers)	EPD	Provide area in m2
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner and 152mm rockwool insulation (~60%), area 8560m²	7019.2	M2	3	Aluminium	Curtain walls - Double glazed	Assumed curtain wall system with aluminium frame, Ramboll	Glass facade, size: 3.6 x 7.2m, double glazing, 51.67 kg/m2, Curtain wall Concept Wall® CW 60 – CW 60 HI (Reynaers)	EPD	Provide area in m2	
	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner and 152mm rockwool insulation (~60%), area 8560m²	22341.6	KG	3	Aluminium	Louvres (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)	OC	Assuming 14.5kg/m2 for louvre door/window (excl frame), 15 horizontal items/ meter of height, 1.5mm gauge, approx. 1kg/liner meter for each item
	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner 2x12.5mm Wallboard, 48/50 'I' stud gypframe and 152mm rockwool insulation (~60%), area 8560m²	86284.8	KG	3	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner 2x12.5mm Wallboard, 48/50 'I' stud gypframe and 152mm rockwool insulation (~60%), area 8560m²	6163.2	KG	3	Steel	Metal framing components - Gypframe 48 S 50 'C' Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))	EPD	Assuming Gypframe® 48 S 50 'C' Stud 1.2kg/m2 @600mm centres (0.52kg/linear meter)
	2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner, 152mm rockwool insulation (~60%), area 8560m²	780.672	M3	3	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, 33 kg/m3, Lambda=0.037 W/(m.K), FLEXI 1200x600x100 (ROCKWOOL, UK plant)	EPD	Provide m3
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	2.5.1.External enclosing walls above ground level	Perpet Wall® aluminium rainscreen cladding, 3mm thick	1511.34	M2	4	Aluminium	Cladding panels (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)	OC	Assuming 11.34kg/m2 (3mm thick), 15.12kg/m2 (4mm thick)
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.6 EXTERNAL WINDOWS

RICS category ▼	Material Description @	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.6.2.External doors	Single door - Automated - assume 0.85m x 2.1m	5.36	M2	1	Aluminium	Glazed Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminium framed glazed doors, double glazed, per sq. meter, 83% glass, 12% aluminium, 3% steel, 40.79, AXILE Family, EDGE Family, KINETIC Family, ELITE	OC	Provide area in m2
2.6.2.External doors	Double door - Automated - Assume 1.2m x 2.1m	2.520	M2	1	Aluminium	Glazed Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminium framed glazed doors, double glazed, per sq. meter, 83% glass, 12% aluminium, 3% steel, 40.79, AXILE Family, EDGE Family, KINETIC Family, ELITE	OC	Provide area in m2
Select	Plenum boxes	609	UNIT				0	0	0	0	0
2.6.2.External doors	Single Doors - LV - assume 0.85m x 2.1m	1.8	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
2.6.2.External doors	Double Doors - Plant Room, Binstore - assume 1.2m x 2.1m	13	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
2.6.2.External doors	Single Escape External Doors - assume 0.85m x 2.1m	3	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
2.6.1.External Windows	Louvres (rear plinth) -assumes 14.5kg/m2	290	KG	1	Aluminium	Louvres (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)	OC	Assuming 14.5kg/m2 for louvre door/window (excl.
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.7 INTERNAL WALLS AND PARTITIONS

	RICS category ▼	Material Description @	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
1	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm	10147.90	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including
2	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm	1922.76	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 EPD		Assuming 0.9kg/m2 (50mm thick)
3	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm	35891.52	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, EPD		Assuming 8.4kg/m2 of elevation area (12.5mm
4	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm	8545.60	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on s	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
5	2.7.1.Walls and Partitions	Stud partitions; Bed/bed100 thick; 2450 high; 12.5mm plasterboard, 3mm	16758.00	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including
6	2.7.1.Walls and Partitions	Stud partitions; Bed/bed bed 100 thick; 2450 high; 12.5mm plasterboard,	3175.20	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 EPD		Assuming 0.9kg/m2 (50mm thick)
7	2.7.1.Walls and Partitions	Stud partitions; Bed/bed bed 100 thick; 2450 high; 12.5mm plasterboard,	59270.40	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, EPD		Assuming 8.4kg/m2 of elevation area (12.5mm
8	2.7.1.Walls and Partitions	Stud partitions; Bed/bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm	14112.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on s	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
9	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard,	54987.19	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including
10	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard,	10418.63	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 EPD		Assuming 0.9kg/m2 (50mm thick)
11	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard,	194481.00	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ wat EPD		Assuming 10.55k/m² (12.5mm thick)
12	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard,	46305.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on s	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
13	2.7.1.Walls and Partitions	EO partitions for junction with external walls						0	0	0	0	0

14	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm	2234.40	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including
15	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm	423.36	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65	EPD	Assuming 0.9kg/m2 (50mm thick)
16	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm	7902.72	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3,	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm
17	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 3mm skim	1881.60	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
18	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. Assumes 0.9kg/m2	62126	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ wat	EPD	Assuming 10.55k/m² (12.5mm thick)
19	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. Assumes 4.75kg/m2	14437	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including vertical and horizontal studs)
20	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim.	304	M3	1	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, :	EPD	Provide m3
21	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. Assumes 1 x 3mm as it's only on one side of the wall - assumes 2kg/m2	6079	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
22	2.7.1.Walls and Partitions	Ditto in Wdw Reveals - Assume 200mm width for window surrounds, 2No. Layers of fire rated	29513	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ wat	EPD	Assuming 10.55k/m² (12.5mm thick)
23	2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) -	2658.25	KG	1	Steel	Metal framing components - Gypframe 70 S 50 Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British	EPD	Assuming Gypframe® 70 S 50 AcouStud 1.4kg/m2
24	2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) -	36.08	M3	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gyproc Coreboard	Ramboll	Gypsum plasterboard, fire resistant, moisture resistant, 19 mm, 16.13 kg/m2, 849 kg/m3, fire resistance class A2-s1, d0, CoreBoard (Saint-Gobain Gyproc,	EPD	
25	2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) -	40063.63	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ wat	EPD	Assuming 10.55k/m² (12.5mm thick)
26	2.7.1.Walls and Partitions	300 mm Blockwork walls; plastered one sides - assumes the thickness of a	94	M3	1	Concrete	Concrete block wall - Lightweight - 140mm (BREEAM/LEED)	Assumed lightweight concrete blocks	Ramboll	Lightweight concrete block, 13N, 0.35 W/mK, 1183.93 kg/m3, Thermal Liteblock (Rc	EPD	Provide m3
27	2.7.1.Walls and Partitions	300 mm Blockwork walls; plastered one sides - plasterd one side	629.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
28	2.7.1.Walls and Partitions	Dry lining to pods - assumes 10kg/m2	46620	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/1	EPD	Assuming 10kg/m2 (12.5mm thick)
29	2.7.1.Walls and Partitions	Dry lining/ Plaster to Core Walls (including cleaners cupboards) -	101745	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/1	EPD	Assuming 10kg/m2 (12.5mm thick)
30	2.7.1.Walls and Partitions	Stud Patyition to management area - 2No. 12.5mm plasterboard, 70mm stud	391	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3,	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm
31	2.7.1.Walls and Partitions	Stud Patyition to management area - 2No. 12.5mm plasterboard, 70mm stud	65	KG	2	Steel	Metal framing components - Gypframe 70 S 50 Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British	EPD	Assuming Gypframe® 70 S 50 AcouStud 1.4kg/m2
32	2.7.1.Walls and Partitions	Stud Patyition to management area - 2No. 12.5mm plasterboard, 70mm stud	93	KG	3	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
33	2.7.1.Walls and Partitions	Rockwool to pods - 50mm of rockwool	83	M3	1	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, :	EPD	Provide m3
34	2.7.1.Walls and Partitions	Cluster Cupboards - assumes 900mm x 600mm x 600mm, assumes density						0	0	0	0	0
35	2.7.1.Walls and Partitions	Fire resistant to pod riser and void above		UNIT	1	Select	Select	N/A	N/A	N/A	N/A	N/A
36	2.7.1.Walls and Partitions	Glazed screen to stairs/reception at Ground Floor (Provisional)	12	M2	1	Aluminium	Glazed Partitions	Assumed double-glazed aluminium frame partitions	Ramboll	Aluminium framed glazed partition systems, double glazed, per m2, 90% glass, 9%	EPD	Provide area in m2
37	2.7.1.Walls and Partitions	EO for single doors - glazed, sliding automatic, access control	36	M2	1	Aluminium	Glazed Sliding Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminum frame sliding door, size: 1.23 x 2.18m, double glazing, 27.87 kg/m2, Slim	OC	Provide area in m2
	Select	Pattressing to entrance doors (PAS 24)- 18mm Selex ply to surround of		UNIT	1	Timber	Select	N/A	N/A	N/A	N/A	N/A
	Select	3 sided letterbox to head of entrances		UNIT	1	Timber	Select	N/A	N/A	N/A	N/A	N/A
	Select	Boxing in detail - cill		M	1	Timber	Select	N/A	N/A	N/A	N/A	N/A
	Select	Blind boxes		M	1	Plasterboard	Select	N/A	N/A	N/A	N/A	N/A
	Select	Plenum boxes		UNIT	1	Steel	Galvanised profiled sheet	Assumed Hot-dip galvanized/zinc coated steel - Coml IstructE		Galvanized profiled steel decking, for composite floor slabs/decks, 1 mm sheet thick	EPD	Provide kg or m3
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
	Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.1 FRAME											
RICS category ▾	Material Description ⓘ	Quantity	Units ▾	Source ▾	Material ▾	Details ▾	Specification	Spec. Source	Carbon Data		Notes/Assumptions
2.1.1.Steel frames	Fire Protection & fire stopping						0	0	0	0	
2.1.4.Concrete frames	Parapet Wall - Podium - typical height is 1m, minimum thickness of 230mm	31	M3	1	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)		Provide m3
2.1.4.Concrete frames	Parapet Wall - Podium - ; Reinforcement @ 65kg/m3	2,033	kg	1	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))		Provide kg/m3
2.1.4.Concrete frames	Parapet Wall - Roof - Reinforcement @ 65kg/m3	38	M3	1	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)		Provide m3
2.1.4.Concrete frames	Parapet Wall - Roof - Reinforcement @ 65kg/m3	2,490	kg	1	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))		Provide kg/m3
2.1.4.Concrete frames	Concrete Columns	579	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)		Provide m3
2.1.4.Concrete frames	Concrete Columns ; Reinforcement - estimated 200kg/m3 reinforcement quantities for columns	115,754	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))		Provide kg/m3
2.1.4.Concrete frames	Concrete Walls	2070	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)		Provide m3
2.1.4.Concrete frames	Concrete Walls ; Reinforcement 65 kg/m3 reinforcement quantities for walls	134572	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))		Provide kg/m3
2.1.4.Concrete frames	Concrete Beams	8	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)		Provide m3
2.1.4.Concrete frames	Concrete Beams ; Reinforcement 230 kg/m3 reinforcement quantities for ground beams	1,917	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))		Provide kg/m3
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A

2.2 UPPER FLOORS											
RICS category ▾	Material Description ⓘ	Quantity	Units ▾	Source ▾	Material ▾	Details ▾	Specification	Spec. Source	Carbon Data		Notes/Assumptions
2.2.1.Floors	Insulation to underside of slab (plantroom, etc)(PROV) - average	17	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))		Provide m3
2.2.1.Floors	Insulation to underside of slab (cycle store)(PROV) - - average thickness of	3	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))		Provide m3
2.2.1.Floors	Insulation to underside of slab to prevent cold bridging (Podium) - Riser flooring (incl Smoke shafts) - 30mm grating assumed	12	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))		Provide m3
2.2.1.Floors		246	M2	1	Plastic	Precast Glass Fibre reinforced concrete	GRP Floor Grating, 30mm thickness	Ramboll	Polyester grating for outdoor use, 17 kg/m2, Caillebotis en polyester pour utilisation extérieure (mailles de 38mm*38mm, hauteur porteur : 30 mm)		
2.2.Upper floor	Concrete upper floors	4419	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Specification	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)		Provide m3
2.2.Upper floor	Concrete upper floors ; Reinforcement 95kg/m3 reinforcement quantities for	419786	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))		Provide kg/m3
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A

2.3 ROOFS											
RICS category ▾	Material Description ⓘ	Quantity	Units ▾	Source ▾	Material ▾	Details ▾	Specification	Spec. Source	Carbon Data		Notes/Assumptions
2.3.2.Roof coverings	Single ply roof coverings -	607	M2	1	Membrane	Single ply roofing membrane	Assumed Synthetic roofing membrane	Ramboll	Synthetic roofing membrane from FPO - PP, 1.934 kg/m2, BauderTHERMOFIN (Paul		Provide area in m2
2.3.2.Roof coverings	Single ply roof coverings - Podium area -	242	M2	1	Membrane	Single ply roofing membrane	Assumed Synthetic roofing membrane	Ramboll	Synthetic roofing membrane from FPO - PP, 1.934 kg/m2, BauderTHERMOFIN (Paul		Provide area in m2
2.3.1.Roof structure	Roof slab	199	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Spec	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II, OC		Provide m3
2.3.1.Roof structure	Reinforecement to roof slab	18876.12	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% EPD		Provide kg/m3
2.3.1.Roof structure	Capping to parapet - Podium - assumed solid concrete coping stones,	3.40	M3	1	Concrete	Precast Concrete - C40/50, 0% GGBS (ICE), Average UK cement mix	Assumed C40/50, 0% Cement Replacement	IstructE	Ready-mix concrete, RC 40/50 (40/50 MPa), with CEM I		Provide m3
2.3.1.Roof structure	Capping to parapet - Roof - assumed solid concrete coping stones, 50mm x	2.71	M3	1	Concrete	Precast Concrete - C40/50, 0% GGBS (ICE), Average UK cement mix	Assumed C40/50, 0% Cement Replacement	IstructE	Ready-mix concrete, RC 40/50 (40/50 MPa), with CEM I		Provide m3
2.3.1.Roof structure	Roof Level Plantroom - Roof Assume lightweight profiled roof deck	55	M2	1	Steel	Profiled sheet for decking	Assumed profiled steel decking part of composite floc	IstructE	Profiled steel decking for composite floor slabs/decking, 0.9mm sheet thickness, 11.:		Provide m2/kg/m3
2.3.2.Roof coverings	Paving to Plant - assumes 72 kg/m2	5400	KG	1	Concrete	Precast Concrete Paving	Assumed Precast concrete	Ramboll	Precast concrete paving products, 2350 kg/m3 (BPCF)		Provide m3 or kgs, Assuming 72kg/m2
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A

2.4 STAIRS AND RAMPS											
RICS category ▾	Material Description ⓘ	Quantity	Units ▾	Source ▾	Material ▾	Details ▾	Specification	Spec. Source	Carbon Data		Notes/Assumptions

2.4.1.Stair and ramp structure	Precast concrete stair going 28 levels (to Roof) - a flight of stairs is	168	M	1	Concrete	Staircase - 140cm wide	Assumed Precast concrete	Ramboll	Precast concrete staircase, 10 steps, width. 140cm, 1422.6kg/m, CEM III/A, VD (SORIBA)	EPD	Provide length (m)
2.4.1.Stair and ramp structure	Precast concrete stair going 22 levels - a flight of stairs is approximately 3m,	162	M	1	Concrete	Staircase - 140cm wide	Assumed Precast concrete	Ramboll	Precast concrete staircase, 10 steps, width. 140cm, 1422.6kg/m, CEM III/A, VD (SORIBA)	EPD	Provide length (m)
2.4.3.Stair and ramp balustrades and	Painted Mild Steel balustrades and ancilleries	440	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
2.4.3.Stair and ramp balustrades and	Painted Mild Steel handrails and ancilleries - includes landing	715	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
2.4.1.Stair and ramp structure	Stringers - 1.5m wide x 440mm	216	M2	1	Steel	Steel Staircase straight	Galvanised steel straight staircase	Ramboll	Galvanized steel staircase, straight, 207.21 kg/m2	EPD	Provide area in m2
2.4.3.Stair and ramp balustrades and	Handrail to Plant rooms	13	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
2.4.1.Stair and ramp structure	Plant room steps - assume 1.5m x 3m	5	M2	1	Steel	Steel Staircase straight	Galvanised steel straight staircase	Ramboll	Galvanized steel staircase, straight, 207.21 kg/m2	EPD	Provide area in m2
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.5 EXTERNAL WALLS

RICS category ▼	Material Description ⓘ	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.5.1.External enclosing walls above ground level	Ground floor - Brickwork, area 435m², single brick cladding, 102.5mm thick	44.5875	M3	3	Clay	Clay Bricks - Façade	Assumed red brick, average production	Ramboll	Red brick, average production, UK, 215 mm x 102.5 mm x 65 mm, 2.13 kg/unit, 1485 kg/m3 (Brick Development Association (BDA) Ltd (2019))	EPD	Provide m3
2.5.1.External enclosing walls above ground level	Ground floor - Brickwork, mortar, area 435m², assuming double brick, 205mm thick	6.688125	KG	Select	Mortar	Masonry/Bricklaying Mortar (BREEAM/LEED)	Cement based mortar for bricklaying	Ramboll	Masonry mortars (CPI Mortars Ltd)	EPD	Provide kg/ton Assuming density 1600kg/m3 - Calculating quantity Assuming 15% of brickwork (6% for blockwork) elevation area (m2) x 102.5mm (brick or block thickness)
2.5.1.External enclosing walls above ground level	Ground floor - 140mm block substrate, area 435m²	60.9	M3	3	Concrete	Concrete block wall - Lightweight - 140mm (BREEAM/LEED)	Assumed lightweight concrete blocks	Ramboll	Lightweight concrete block, 13N, 0.35 W/mK, 1183.93 kg/m3, Thermal Liteblock (Roadstone)	EPD	Provide m3
2.5.1.External enclosing walls above ground level	Ground floor - Curtain walling	177	M2	3	Aluminium	Curtain walls - Double glazed	Assumed curtain wall system with aluminium frame,	Ramboll	Glass facade, size: 3.6 x 7.2m, double glazing, 51.67 kg/m2, Curtain wall Concept Wall® CW 60 – CW 60 HI (Reynaers)	EPD	Provide area in m2
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner and 152mm rockwool insulation (~60%), area 8560m²	7019.2	M2	3	Aluminium	Curtain walls - Double glazed	Assumed curtain wall system with aluminium frame,	Ramboll	Glass facade, size: 3.6 x 7.2m, double glazing, 51.67 kg/m2, Curtain wall Concept Wall® CW 60 – CW 60 HI (Reynaers)	EPD	Provide area in m2
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner and 152mm rockwool insulation (~60%), area 8560m²	22341.6	KG	3	Aluminium	Louvres (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)	OC	Assuming 14.5kg/m2 for louvre door/window (excl. frame), 15 horizontal items/ meter of height, 1.5mm gauge, approx. 1kg/liner meter for each item
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner 2x12.5mm Wallboard, 48/50 'I' stud gypframe and 152mm rockwool insulation (~60%), area 8560m²	86284.8	KG	3	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner 2x12.5mm Wallboard, 48/50 'I' stud gypframe and 152mm rockwool insulation (~60%), area 8560m²	6163.2	KG	3	Steel	Metal framing components - Gypframe 48 S 50 'C' Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))	EPD	Assuming Gypframe® 48 S 50 'C' Stud 1.2kg/m2 @600mm centres (0.52kg/linear meter)
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner, 152mm rockwool insulation (~60%), area 8560m²	780.672	M3	3	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, 33 kg/m3, Lambda=0.037 W/(m.K), FLEXI 1200x600x100 (ROCKWOOL, UK plant)	EPD	Provide m3
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
2.5.1.External enclosing walls above ground level	Perpet Walls, SFS 100.12, assume 3m width height x 50% of 180m length, A = 400m²	2308.5	KG	4	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including vertical and horizontal studs)
2.5.1.External enclosing walls above ground level	Perpet Walls, aluminium rainscreen cladding, 3mm thick	5511.24	KG	4	Aluminium	Cladding panels (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)	OC	Assuming 11.34kg/m2 (3mm thick), 15.12kg/m2 (4mm thick)
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.6 EXTERNAL WINDOWS

RICS category ▼	Material Description ⓘ	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.6.2.External doors	Single door - Automated - assume 0.85m x 2.1m	5.36	M2	1	Aluminium	Glazed Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminium framed glazed doors, double glazed, per sq. meter, 83% glass, 12% aluminium, 3% steel, 40.79, AXILE Family, EDGE Family, KINETIC Family, ELITE	OC	Provide area in m2
2.6.2.External doors	Double door - Automated - Assume 1.2m x 2.1m	2.520	M2	1	Aluminium	Glazed Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminium framed glazed doors, double glazed, per sq. meter, 83% glass, 12% aluminium, 3% steel, 40.79, AXILE Family, EDGE Family, KINETIC Family, ELITE	OC	Provide area in m2
Select	Plenum boxes	609	UNIT				0	0	0	0	0

2.6.2.External doors	Single Doors - LV - assume 0.85m x 2.1m	1.8	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
2.6.2.External doors	Double Doors - Plant Room, Binstore - assume 1.2m x 2.1m	13	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
2.6.2.External doors	Single Escape External Doors - assume 0.85m x 2.1m	3	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)	EPD	Provide area in m2
2.6.1.External Windows	Louvres (rear plinth) -assumes 14.5kg/m2	290	KG	1	Aluminium	Louvres (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)	OC	Assuming 14.5kg/m2 for louvre door/window (excl.
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.7 INTERNAL WALLS AND PARTITIONS											
RICS category ▼	Material Description 🔗	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm	10147.90	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including
2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm	1922.76	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65	EPD	Assuming 0.9kg/m2 (50mm thick)
2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm	35891.52	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3,	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm
2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm	8545.60	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on :	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
2.7.1.Walls and Partitions	Stud partitions; Bed/bed100 thick; 2450 high; 12.5mm plasterboard,	16758.00	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including
2.7.1.Walls and Partitions	Stud partitions; Bed/bed bed 100 thick; 2450 high; 12.5mm	3175.20	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65	EPD	Assuming 0.9kg/m2 (50mm thick)
2.7.1.Walls and Partitions	Stud partitions; Bed/bed bed 100 thick; 2450 high; 12.5mm	59270.40	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3,	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm
2.7.1.Walls and Partitions	Stud partitions; Bed/bed 100 thick; 2450 high; 12.5mm plasterboard,	14112.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on :	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm	54987.19	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including
2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm	10418.63	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65	EPD	Assuming 0.9kg/m2 (50mm thick)
2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm	194481.00	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ wat	EPD	Assuming 10.55k/m² (12.5mm thick)
2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm	46305.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on :	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
2.7.1.Walls and Partitions	EO partitions for junction with external walls						0	0	0	0	0
2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm	2234.40	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including
2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm	423.36	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65	EPD	Assuming 0.9kg/m2 (50mm thick)
2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm	7902.72	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3,	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm
2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm	1881.60	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on :	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire	62126	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ wat	EPD	Assuming 10.55k/m² (12.5mm thick)
2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire	14437	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including
2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire	304	M3	1	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, :	EPD	Provide m3
2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire	6079	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on :	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
2.7.1.Walls and Partitions	Ditto in Wdw Reveals - Assume 200mm width for window surrounds,	29513	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ wat	EPD	Assuming 10.55k/m² (12.5mm thick)
2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) -	2658.25	KG	1	Steel	Metal framing components - Gypframe 70 S 50 Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British	EPD	Assuming Gypframe® 70 S 50 AcouStud 1.4kg/m2
2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) -	36.08	M3	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gyproc Coreboard	Ramboll	Gypsum plasterboard, fire resistant, moisture resistant, 19 mm, 16.13 kg/m2, 849 kg/m3, fire resistance class A2-s1, d0, CoreBoard (Saint-Gobain Gyproc,	EPD	
2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) -	40063.63	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ wat	EPD	Assuming 10.55k/m² (12.5mm thick)
2.7.1.Walls and Partitions	300 mm Blockwork walls; plastered one sides - assumes the thickness of a	94	M3	1	Concrete	Concrete block wall - Lightweight - 140mm (BREEAM/LEED)	Assumed lightweight concrete blocks	Ramboll	Lightweight concrete block, 13N, 0.35 W/mK, 1183.93 kg/m3, Thermal Liteblock (Rc	EPD	Provide m3
2.7.1.Walls and Partitions	300 mm Blockwork walls; plastered one sides - plasterd one side	629.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on :	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
2.7.1.Walls and Partitions	Dry lining to pods - assumes 10kg/m2	46620	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/1	EPD	Assuming 10kg/m2 (12.5mm thick)
2.7.1.Walls and Partitions	Dry lining/ Plaster to Core Walls (including cleaners cupboards) -	101745	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/1	EPD	Assuming 10kg/m2 (12.5mm thick)
2.7.1.Walls and Partitions	Stud Patytion to management area - 2No. 12.5mm plasterboard, 70mm	391	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3,	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm
2.7.1.Walls and Partitions	Stud Patytion to management area - 2No. 12.5mm plasterboard, 70mm	65	KG	2	Steel	Metal framing components - Gypframe 70 S 50 Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British	EPD	Assuming Gypframe® 70 S 50 AcouStud 1.4kg/m2
2.7.1.Walls and Partitions	Stud Patytion to management area - 2No. 12.5mm plasterboard, 70mm	93	KG	3	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on :	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
2.7.1.Walls and Partitions	Rockwool to pods - 50mm of rockwool	83	M3	1	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, :	EPD	Provide m3
2.7.1.Walls and Partitions	Cluster Cupboards - assumes 900mm x 600mm x 600mm, assumes density						0	0	0	0	0
2.7.1.Walls and Partitions	Fire resistant to pod riser and void above		UNIT	1	Select	Select	N/A	N/A	N/A	N/A	N/A
2.7.1.Walls and Partitions	Glazed screen to stairs/reception at Ground Floor (Provisional)	12	M2	1	Aluminium	Glazed Partitions	Assumed double-glazed aluminium frame partitions	Ramboll	Aluminium framed glazed partition systems, double glazed, per m2, 90% glass, 9%	EPD	Provide area in m2
2.7.1.Walls and Partitions	EO for single doors - glazed, sliding automatic access control	36	M2	1	Aluminium	Glazed Sliding Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminum frame sliding door, size: 1.23 x 2.18m, double glazing, 27.87 kg/m2, Slirr	OC	Provide area in m2
Select	Pattressing to entrance doors (PAS 24)- 18mm Selex ply to surround of		UNIT	1	Timber	Select	N/A	N/A	N/A	N/A	N/A

Select	3 sided letterbox to head of entrances		UNIT	1	Timber	Select	N/A	N/A	N/A	N/A	N/A
Select	Boxing in detail - cill		M	1	Timber	Select	N/A	N/A	N/A	N/A	N/A
Select	Blind boxes		M	1	Plasterboard	Select	N/A	N/A	N/A	N/A	N/A
Select	Plenum boxes		UNIT	1	Steel	Galvanised profiled sheet	Assumed Hot-dip galvanized/zinc coated steel - Com IstructE	Galvanized profiled steel decking, for composite floor slabs/decks, 1 mm sheet thickr EPD			Provide kg or m3
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.1 FRAME											
RICS category ▼	Material Description ⓘ	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.1.1.Steel frames	Fire Protection & fire stopping						0	0	0	0	0
2.1.4.Concrete frames	Parapet Wall - Podium - typical height is 1m, minimum thickness of 230mm	31	M3	1	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
2.1.4.Concrete frames	Parapet Wall - Podium - ; Reinforcement @ 65kg/m3	2,033	kg	1	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
2.1.4.Concrete frames	Parapet Wall - Roof - 3.625m high, 0.2m wide	78	M3	1	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
2.1.4.Concrete frames	Parapet Wall - Roof - ; Reinforcement ; 65kg/m3	5,090	kg	1	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
2.1.4.Concrete frames	Concrete Columns	579	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
2.1.4.Concrete frames	Concrete Columns ; Reinforcement - estimated 200kg/m3 reinforcement quantities for columns	115,754	KG		Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
2.1.4.Concrete frames	Concrete Walls	2070	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
2.1.4.Concrete frames	Concrete Walls ; Reinforcement 65 kg/m3 reinforcement quantities for walls	134572	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
2.1.4.Concrete frames	Concrete Beams	8	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
2.1.4.Concrete frames	Concrete Beams ; Reinforcement 230 kg/m3 reinforcement quantities for ground beams	1,917	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.2 UPPER FLOORS											
RICS category ▼	Material Description ⓘ	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.2.1.Floors	Insulation to underside of slab (plantroom, etc)(PROV) - average thickness of 50mm.assumed.	17	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))	EPD	Provide m3
2.2.1.Floors	Insulation to underside of slab (cycle store)(PROV) - - average thickness of 50mm assumed.	3	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))	EPD	Provide m3
2.2.1.Floors	Insulation to underside of slab to prevent cold bridging (Podium) - average thickness of 50mm.assumed.	12	M3	1	Insulation	Roof - XPS	Assumed XPS	Ramboll	XPS insulation board, 0.033 W/mK, 34 kg/m3, Roofboard Extra, Floorboard Extra, Laminating Board Extra (Polyfoam XPS Ltd (2021))	EPD	Provide m3
2.2.1.Floors	Riser flooring (incl Smoke shafts) - 30mm grating assumed	246	M2	1	Plastic	Precast Glass Fibre reinforced concrete	GRP Floor Grating, 30mm thickness	Ramboll	Polyester grating for outdoor use, 17 kg/m2, Caillebotis en polyester pour utilisation extérieure (mailles de 38mm*38mm. hauteur porteur : 30 mm)	EPD	
2.2.Upper floor	Concrete upper floors	4419	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	Provide m3
2.2.Upper floor	Concrete upper floors ; Reinforcement 95kg/m3 reinforcement quantities for slabs	419786	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	Provide kg/m3
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.3 ROOFS											
RICS category ▼	Material Description ⓘ	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.3.2.Roof coverings	Single ply roof coverings -	607	M2	1	Membrane	Single ply roofing membrane	Assumed Synthetic roofing membrane	Ramboll	Synthetic roofing membrane from FPO - PP, 1.934 kg/m2, BauderTHERMOFIN (Paul Bauder)	EPD	Provide area in m2
2.3.2.Roof coverings	Single ply roof coverings - Podium area -	242	M2	1	Membrane	Single ply roofing membrane	Assumed Synthetic roofing membrane	Ramboll	Synthetic roofing membrane from FPO - PP, 1.934 kg/m2, BauderTHERMOFIN (Paul Bauder)	EPD	Provide area in m2
2.3.1.Roof structure	Roof slab	199	M3	2	Concrete	Superstructure C35/45, 20% GGBS (BREEAM/LEED)	Assumed C35/45, 20% Cement Replacement	Project Spec	Ready-mix concrete, normal strength, generic, C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m3; 21.2 lbs/ft3 total cement)	OC	
2.3.1.Roof structure	Reinforecment to roof slab	18876.12	KG	2	Steel	Reinforcement bars	Assumed reinforcement support for concrete (UK)	IstructE	Carbon steel reinforcing bar (secondary production route – scrap), 7850 kg/m3, 96% recycled steel (UK Cares (2020))	EPD	
2.3.1.Roof structure	Capping to parapet - Podium - assumed solid concrete coping stones, 50mm x 500mm	3.40	M3	1	Concrete	Precast Concrete - C40/50, 0% GGBS (ICE), Average UK cement mix	Assumed C40/50, 0% Cement Replacement	IstructE	Ready-mix concrete, RC 40/50 (40/50 MPa), with CEM I	ICE	Provide m3
2.3.1.Roof structure	Capping to parapet - Roof - assumed solid concrete coping stones, 50mm x 500mm	2.71	M3	1	Concrete	Precast Concrete - C40/50, 0% GGBS (ICE), Average UK cement mix	Assumed C40/50, 0% Cement Replacement	IstructE	Ready-mix concrete, RC 40/50 (40/50 MPa), with CEM I	ICE	Provide m3
2.3.1.Roof structure	Roof Level Plantroom - Roof Assume lightweight profiled roof deck	55	M2	1	Steel	Profiled sheet for decking	Assumed profiled steel decking part of composite floc	IstructE	Profiled steel decking for composite floor slabs/decking, 0.9mm sheet thickness, 11.35kg/m2, ComFlor 80 0.9mm steel structural floor deck (Tata Steel)	EPD	Provide m2/kg/m3
2.3.2.Roof coverings	Paving to Plant - assumes 72 kg/m2	5400	KG	1	Concrete	Precast Concrete Paving	Assumed Precast concrete	Ramboll	Precast concrete paving products, 2350 kg/m3 (BPCF)	EPD	Provide m3 or kgs, Assuming 72kg/m2
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.4 STAIRS AND RAMPS											
RICS category ▼	Material Description ⓘ	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data	Carbon Source	Notes/Assumptions
2.4.1.Stair and ramp structure	Precast concrete stair going 28 levels (to Roof) - a flight of stairs is approximately 3m, assume 2 flights per level.	168	M	1	Concrete	Staircase - 140cm wide	Assumed Precast concrete	Ramboll	Precast concrete staircase, 10 steps, width. 140cm, 1422.6kg/m, CEM III/A, VD (SORIBA)	EPD	Provide length (m)

2.4.1.Stair and ramp structure	Precast concrete stair going 22 levels - a flight of stairs is approximately 3m, assume 2 flights per level	162	M	1	Concrete	Staircase - 140cm wide	Assumed Precast concrete	Ramboll	Precast concrete staircase, 10 steps, width. 140cm, 1422.6kg/m, CEM III/A, VD (SORIBA)	EPD	Provide length (m)
2.4.3.Stair and ramp balustrades and	Painted Mild Steel balustrades and ancilleries	440	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
2.4.3.Stair and ramp balustrades and	Painted Mild Steel handrails and ancilleries - includes landing	715	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
2.4.1.Stair and ramp structure	Stringers - 1.5m wide x 440mm	216	M2	1	Steel	Steel Staircase straight	Galvanised steel straight staircase	Ramboll	Galvanized steel staircase, straight, 207.21 kg/m2	EPD	Provide area in m2
2.4.3.Stair and ramp balustrades and	Handrail to Plant rooms	13	M	1	Steel	Handrail	Assumed stainless steel	Ramboll	Stainless steel handrail, diam. 45mm, Donnee par default (MDEGD)	EPD	Provide length (m)
2.4.1.Stair and ramp structure	Plant room steps - assume 1.5m x 3m	5	M2	1	Steel	Steel Staircase straight	Galvanised steel straight staircase	Ramboll	Galvanized steel staircase, straight, 207.21 kg/m2	EPD	Provide area in m2
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A	N/A	N/A

2.5 EXTERNAL WALLS											
RICS category ▼	Material Description @	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data		Notes/Assumptions
2.5.1.External enclosing walls	Ground floor - Brickwork, area 435m², single brick cladding, 102.5mm thick	44.5875	M3	3	Clay	Clay Bricks - Façade	Assumed red brick, average production	Ramboll	Red brick, average production, UK, 215 mm x 102.5 mm x 65 mm, 2.13 kg/unit, 1485 kg/m3 (Brick Development Association (BDA) Ltd (2019))		Provide m3
2.5.1.External enclosing walls	Ground floor - Brickwork, mortar, area 435m², assuming double brick, 205mm thick	6.688125	KG	Select	Mortar	Masonry/Bricklaying Mortar (BREEAM/LEED)	Cement based mortar for bricklaying	Ramboll	Masonry mortars (CPI Mortars Ltd)		Provide kg/ton Assuming density 1600kg/m3 -
2.5.1.External enclosing walls	Ground floor - 140mm block substrate, area 435m²	60.9	M3	3	Concrete	Concrete block wall - Lightweight - 140mm (BREEAM/LEED)	Assumed lightweight concrete blocks	Ramboll	Lightweight concrete block, 13N, 0.35 W/mK, 1183.93 kg/m3, Thermal Liteblock (Roadstone)		Provide m3
2.5.1.External enclosing walls	Ground floor - Curtain walling	177	M2	3	Aluminium	Curtain walls - Double glazed	Assumed curtain wall system with aluminium frame,	Ramboll	Glass facade, size: 3.6 x 7.2m, double glazing, 51.67 kg/m2, Curtain wall Concept Wall@ CW 60 – CW 60 HI (Reynaers)		Provide area in m2
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner and 152mm rockwool insulation (~60%), area 8560m²	7019.2	M2	3	Aluminium	Curtain walls - Double glazed	Assumed curtain wall system with aluminium frame,	Ramboll	Glass facade, size: 3.6 x 7.2m, double glazing, 51.67 kg/m2, Curtain wall Concept Wall@ CW 60 – CW 60 HI (Reynaers)		Provide area in m2
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner and 152mm rockwool insulation (~60%), area 8560m²	22341.6	KG	3	Aluminium	Louvres (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)		Assuming 14.5kg/m2 for louvre door/window (excl. frame), 15 horizontal items/ meter of height, 1.5mm gauge, approx. 1kg/liner meter for each item
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner 2x12.5mm Wallboard, 48/50 'I' stud gyframe and 152mm rockwool insulation (~60%), area 8560m²	86284.8	KG	3	Plasterboard	Partitioning/ Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))		Assuming 8.4kg/m2 of elevation area (12.5mm thick)
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner 2x12.5mm Wallboard, 48/50 'I' stud gyframe and 152mm rockwool insulation (~60%), area 8560m²	6163.2	KG	3	Steel	Metal framing components - Gypframe 48 S 50 'C' Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))		Assuming Gypframe® 48 S 50 'C' Stud 1.2kg/m2 @600mm centres (0.52kg/linear meter)
2.5.1.External enclosing walls above ground level	UCW - Glass fronted, double alu frame, except aluminium rapid vents (~18%) with independent drywall liner, 152mm rockwool insulation (~60%), area 8560m²	780.672	M3	3	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool	Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, 33 kg/m3, Lambda=0.037 W/(m.K), FLEXI 1200x600x100 (ROCKWOOL, UK plant)		Provide m3
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A
2.5.1.External enclosing walls above ground level	Plenum Walls, aluminium reinforced cladding, steel br	7011.24	M2	3	Aluminium	Cladding panels (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)		Assuming 11.34kg/m2 (3mm thick), 15.12kg/m2 (4mm thick)
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A

2.6 EXTERNAL WINDOWS											
RICS category ▼	Material Description @	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data		Notes/Assumptions
2.6.2.External doors	Single door - Automated - assume 0.85m x 2.1m	5.36	M2	1	Aluminium	Glazed Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminium framed glazed doors, double glazed, per sq. meter, 83% glass, 12% aluminium, 3% steel, 40.79, AXILE Family, EDGE Family, KINETIC Family, ELITE		Provide area in m2
2.6.2.External doors	Double door - Automated - Assume 1.2m x 2.1m	2.520	M2	1	Aluminium	Glazed Doors	Assumed Aluminium frame double glazing	Ramboll	Aluminium framed glazed doors, double glazed, per sq. meter, 83% glass, 12% aluminium, 3% steel, 40.79, AXILE Family, EDGE Family, KINETIC Family, ELITE		Provide area in m2
Select	Plenum boxes	609	UNIT								
2.6.2.External doors	Single Doors - LV - assume 0.85m x 2.1m	1.8	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)		Provide area in m2
2.6.2.External doors	Double Doors - Plant Room, Binstore - assume 1.2m x 2.1m	13	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor) (Hörmann Legnica)		Provide area in m2
2.6.2.External doors	Single Escape External Doors - assume 0.85m x 2.1m	3	M2	1	Steel	Door	Assumed steel door	Ramboll	Steel doors, 28.3 kg/m2, ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwinator) (Hörmann Legnica)		Provide area in m2
2.6.1.External Windows	Louvres (rear plinth) -assumes 14.5kg/m2	290	KG	1	Aluminium	Louvres (BREEAM/LEED)	European Average, 20% recycled content	Ramboll	Aluminium sheet, generic, 20% recycled content, average European technology (One Click LCA 2022)		Assuming 14.5kg/m2 for louvre door/window (excl.
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A
Select			Select	Select	Select	Select	N/A	N/A	N/A		N/A

2.7 INTERNAL WALLS AND PARTITIONS											
RICS category ▼	Material Description @	Quantity	Units ▼	Source ▼	Material ▼	Details ▼	Specification	Spec. Source	Carbon Data		Notes/Assumptions
2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 75x38mm studs @ 600mm crs	2071.00	KG	1	Timber	Studwork/Framing/Flooring (ICE)	Softwood (ICE database)	IstructE/ RIC Timber, Softwood			Provide kg (density 500kg/m3)
2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - Gypframe RB1 Resiliant bars @ 600mm vertical crs, both sides	1742.26	KG	1	Steel	Metal framing components - Gypframe 48 S 50 'C' Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))		Assuming Gypframe® 48 S 50 'C' Stud 1.2kg/m2 @600mm centres (0.52kg/linear meter)

	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 50mm APR Insulation assumed	1922.76	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 mm, 18 kg/m3, APR1200 (Isover)	EPD	Assuming 0.9kg/m2 (50mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 12.5mm plasterboard	35891.52	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Corridor/ cluster bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 3mm skim	8545.60	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Stud partitions; Bed/bed100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 75x38mm studs @ 600mm crs	3420.00	KG	1	Timber	Studwork/Framing/Flooring (ICE)	Softwood (ICE database)	IstructE/ RICS Timber, Softwood		ICE	Provide kg (density 500kg/m3)
	2.7.1.Walls and Partitions	Stud partitions; Bed/bed100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - Gypframe RB1 Resilient bars @ 600mm vertical crs, both sides	2877.12	KG	1	Steel	Metal framing components - Gypframe 48 S 50 'C' Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))	EPD	Assuming Gypframe® 48 S 50 'C' Stud 1.2kg/m2 @600mm centres (0.52ka/linear meter)
	2.7.1.Walls and Partitions	Stud partitions; Bed/bed bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 50mm APR Insulation assumed	3175.20	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 mm, 18 kg/m3, APR1200 (Isover)	EPD	Assuming 0.9kg/m2 (50mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Bed/bed bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 12.5mm plasterboard	59270.40	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Bed/bed 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 3mm skim	14112.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 75x38mm studs @ 600mm crs	11221.88	KG	1	Timber	Studwork/Framing/Flooring (ICE)	Softwood (ICE database)	IstructE/ RICS Timber, Softwood		ICE	Provide kg (density 500kg/m3)
	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - Gypframe RB1 Resilient bars @ 600mm vertical crs, both sides	9440.55	KG	1	Steel	Metal framing components - Gypframe 48 S 50 'C' Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))	EPD	Assuming Gypframe® 48 S 50 'C' Stud 1.2kg/m2 @600mm centres (0.52ka/linear meter)
	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 50mm APR Insulation assumed	10418.63	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 mm, 18 kg/m3, APR1200 (Isover)	EPD	Assuming 0.9kg/m2 (50mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 12.5mm plasterboard	194481.00	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ water vapour resistance, Gyproc FireLine (British Gypsum (2019))	EPD	Assuming 10.55k/m² (12.5mm thick)
	2.7.1.Walls and Partitions	Stud partitions; Studios (FD60) 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 3mm skim	46305.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	EO partitions for junction with external walls						0	0	0	0	0
	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 75x38mm studs @ 600mm crs	456.00	KG	1	Timber	Studwork/Framing/Flooring (ICE)	Softwood (ICE database)	IstructE/ RICS Timber, Softwood		ICE	Provide kg (density 500kg/m3)
	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - Gypframe RB1 Resilient bars @ 600mm vertical crs, both sides	383.62	KG	1	Steel	Metal framing components - Gypframe 48 S 50 'C' Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))	EPD	Assuming Gypframe® 48 S 50 'C' Stud 1.2kg/m2 @600mm centres (0.52ka/linear meter)
	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 50mm APR	423.36	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 mm, 18 kg/m3, APR1200 (Isover)	EPD	Assuming 0.9kg/m2 (50mm thick)
	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 12.5mm plasterboard	7902.72	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.7.1.Walls and Partitions	Stud partitions to Amenity Space; Assume 100 thick; 2450 high; 12.5mm plasterboard, 3mm skim - 2 x 3mm skim	1881.60	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. Assumes 0.9kg/m2	2736	KG	1	Insulation	Internal Walls - Glass wool	Glass wool - Isover	Ramboll	Glass wool/mineral wool insulation, acoustic partition roll, L = 0.039W/mK, T: 50-65 mm, 18 kg/m3, APR1200 (Isover)	EPD	Assuming 0.9kg/m2 (50mm thick)
	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. Assumes 4.75kg/m2	14437	KG	1	Steel	SFS - 100.50.12 @ 600mm centres	Assumed Galvanised steel, 20% Recycled Content	RICS	Steel sheets, generic, 20% recycled content, S235, S275 and S355	OC	Assuming 4.75 kg/m2 of elevation (including vertical and horizontal studs)
	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. - assumes 8.4kg/m2	25531	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 10µ water vapour resistance, Gyproc WallBoard (British Gypsum (2019))	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.7.1.Walls and Partitions	Plasterboard to external walls 1hr fire rating; 2nr layers 12.5mm Knauf Fire Panel one side on 100mm SFS (SFS framing measured elsewhere) at 600mm centres with 100mm Rockwool RWA45 between studs; skim. Assumes 1 x 3mm as it's only on	6079	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Ditto in Wdw Reveals - Assume 200mm width for window surrounds, 2No. Layers of fire rated	29513	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ water vapour resistance, Gyproc FireLine (British Gypsum (2019))	EPD	Assuming 10.55k/m² (12.5mm thick)
	2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) - Assumed build up: gypframe 60 I70 @ 600mm crs, grproc coreboard 19mm between studs, 2 layers 12.5mm Fireline to non shaft side	2658.25	KG	1	Steel	Metal framing components - Gypframe 70 S 50 Studs	Assumed hot-dip galvanized sheet steel - light gauge	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British Gypsum Saint Gobain (2021))	EPD	Assuming Gypframe® 70 S 50 AcouStud 1.4kg/m2 @600mm centres (0.61kg/linear meter)
	2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) - Assumed build up: gypframe 60 I70 @ 600mm crs, grproc coreboard 19mm between studs, 2 layers 12.5mm Fireline to non shaft side	36.08	M3	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gyproc Coreboard	Ramboll	Gypsum plasterboard, fire resistant, moisture resistant, 19 mm, 16.13 kg/m2, 849 kg/m3, fire resistance class A2-s1, d0, CoreBoard (Saint-Gobain Gyproc, Kingscourt plant)	EPD	
	2.7.1.Walls and Partitions	Shaft wall; 2 hour FR; Lining to external wall (Spread of flame) - Assumed build up: gypframe 60 I70 @ 600mm crs, grproc coreboard 19mm between studs, 2 layers 12.5mm Fireline to non shaft side	40063.63	KG	1	Plasterboard	Int.Walls - Gyproc FireLine	Gypsum board A2 fire class	Ramboll	Gypsum plasterboard, fire resistant, 12.5/15 mm, 843 kg/m3, A2 fire class, 10µ water vapour resistance, Gyproc FireLine (British Gypsum (2019))	EPD	Assuming 10.55k/m² (12.5mm thick)
	2.7.1.Walls and Partitions	300 mm Blockwork walls; plastered one sides - assumes the thickness of a concrete wall is 8 inches (0.2032 meters)	94	M3	1	Concrete	Concrete block wall - Lightweight - 140mm (BREEAM/LEED)	Assumed lightweight concrete blocks	Ramboll	Lightweight concrete block, 13N, 0.35 W/mK, 1183.93 kg/m3, Thermal Liteblock (Roadstone)	EPD	Provide m3
	2.7.1.Walls and Partitions	300 mm Blockwork walls; plastered one sides - plasterd one side	629.00	KG	1	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied
	2.7.1.Walls and Partitions	Dry lining to pods - assumes 10kg/m2	46620	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/12.5 mm, 800 kg/m3, 10µ water resistance, Glasroc H TILEBACKER (British Gypsum)	EPD	Assuming 10kg/m2 (12.5mm thick)
	2.7.1.Walls and Partitions	Dry lining/ Plaster to Core Walls (including cleaners cupboards) - assumes 10kg/m2	101745	KG	1	Plasterboard	Plasterboard/Tileboard	Specialty gypsum board for tiling surface	Ramboll	Gypsum plasterboard, reinforced, water resistant, with square edges, 1200x900x6/1	EPD	Assuming 10kg/m2 (12.5mm thick)
	2.7.1.Walls and Partitions	Stud Patytion to management area - 2No. 12.5mm plasterboard, 70mm stud @ 600mm crs, 3mm plaster skim both sides	391	KG	1	Plasterboard	Partitioning/Ceiling - Gyproc Wallboard	Gypsum plasterboard	Ramboll	Gypsum plasterboard, tapered or square edges, 12.5 mm, 8.44 kg/m2, 675 kg/m3, 1	EPD	Assuming 8.4kg/m2 of elevation area (12.5mm thick)
	2.7.1.Walls and Partitions	Stud Patytion to management area - 2No. 12.5mm plasterboard, 75x38mm studs @ 600mm crs, 3mm plaster skim both sides	45.13	KG	1	Timber	Studwork/Framing/Flooring (ICE)	Softwood (ICE database)	IstructE/ RICS Timber, Softwood		ICE	Provide kg (density 500ka/m3)
	2.7.1.Walls and Partitions	Stud Patytion to management area - 2No. 12.5mm plasterboard, Gypframe RB1 Resilient bars @ 600mm vertical crs, both sides, 3mm plaster skim both sides	37.96	KG	1	Steel	Metal framing components - Gypframe 48 S 50 'C' Studs	Assumed hot-dip galvanized sheet steel - light gauge profiles	Ramboll	Metal framing components for gypsum plasterboard, 7750 kg/m3, Gypframe (British	EPD	
	2.7.1.Walls and Partitions	Stud Patytion to management area - 2No. 12.5mm plasterboard, 70mm stud @ 600mm crs, 3mm plaster skim both sides	93	KG	3	Clay/Lime Plaster	Natural Mineral Plaster - Internal application	Natural clay lime plaster (powdered form, mixed on site with clean water)	Ramboll	Natural clay lime plaster, Clime (Armourcoat)	EPD	2-3kg/m2 of 2 coats applied

assume this is included in FFE allowan ce io ask about the RICS guidanc e for these - to exclude / conting env	2.7.1.Walls and Partitions	Rockwool to pods - 50mm of rockwool	83	M3	1	Insulation	Ext.Walls - between SFS - Rockwool	Rockwool		Ramboll	Rock wool insulation panels, L=0.037 W/mK, R=2.63 m2k/W, 100 mm, 3.3 kg/m2, 33 kg/m3, Lambda=0.037 W/(m.K), FLEXI 1200x600x100 (ROCKWOOL, UK plant)	EPD	Provide m3
	2.7.1.Walls and Partitions	Cluster Cupboards - assumes 900mm x 600mm x 600mm, assumes density 500kg/m3											
	2.7.1.Walls and Partitions	Fire resistant to pod riser and void above		UNIT	1	Select	Select						
	2.7.1.Walls and Partitions	Glazed screen to stairs/reception at Ground Floor (Provisional)	12	M2	1	Aluminium	Glazed Partitions	Assumed double-glazed aluminium frame partitions		Ramboll	Aluminium framed glazed partition systems, double glazed, per m2, 90% glass, 9% aluminium, width 3.0m; height 2.70m, glazing thickness 12mm, Optima 117, 217, Revolution 54,100, Kinetic, Technishield (Optima)	EPD	Provide area in m2
	2.7.1.Walls and Partitions	EO for single doors - glazed, sliding automatic, access control	36	M2	1	Aluminium	Glazed Sliding Doors	Assumed Aluminium frame double glazing		Ramboll	Aluminum frame sliding door, size: 1.23 x 2.18m, double glazing, 27.87 kg/m2, SlimLine 38 Door (Reynaers)	OC	Provide area in m2
	Select	Pattressing to entrance doors (PAS 24)- 18mm Selex ply to surround of door opening		UNIT	1	Timber	Select						
	Select	3 sided letterbox to head of entrances		UNIT	1	Timber	Select						
	Select	Boxing in detail - cill		M	1	Timber	Select						
	Select	Blind boxes		M	1	Plasterboard	Select						
	Select	Plenum boxes		UNIT	1	Steel	Galvanised profiled sheet						
	Select			Select	Select	Select	Select	N/A		N/A	N/A	N/A	N/A

6. APPENDIX 2 – DATA SUMMARY (OPTION 1 BASELINE)

Appendix: documentation of LCA data used in the study

The following data points have been used as sources for this assessment. All data used complies with ISO 14040 and 14044 and is drawn from One Click LCA database and has been verified following the BRE-verified data qualification methodology by LCA data specialists.

Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
Aluminium framed glazed doors, double glazed, per sq. meter	[unitedKingdom]	AXILE Family, EDGE Family, KINETIC Family, ELITE Aero		2017	EPD Aluminium Framed Glazed Doors	EN15804+A1	S-P-00480	International EPD System	Optima	PCR 2012:01 Construction products and Construction services, ver. 2.01, 09/03/2016	Only with EN15804	83% glass, 12% aluminium, 3% steel, 40.79	ecoinvent	verified
Aluminium framed glazed partition systems, double glazed, per m2	[unitedKingdom]	Optima 117, 217, Revolution 54,100, Kinetic, Technishield		2017	EPD Aluminium Framed Glazed Doors	EN15804+A1	S-P-00481	International EPD System	Optima	PCR 2012:01 Construction products and Construction services, ver. 2.01, 09/03/2016	Only with EN15804	90% glass, 9% aluminium, width 3.0m; height 2.70m, glazing thickness 12mm	ecoinvent	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
Aluminium sheet, generic	[LOCAL]		2700.0	2022	One Click LCA	EN15804+A1, EN15804+A2	-	One Click LCA	One Click LCA 2022	EN15804+A1	-	20% recycled content, average European aluminium manufacturing technology	ecoinvent	internally
Aluminium frame sliding door	[belgium]	SlimLine 38 Door		2016	EPD SlimLine 38 Door	EN15804+A1	EPD EUROPEAN ALUMINIUM 2016 – REYNAERS 2	European Aluminium	Reynaers	EAA Product Category Rules (PCR) for Aluminium Building Products – version of 30 January 2013	Only with EN15804	size: 1.23 x 2.18m, double glazing, 27.87 kg/m2	GaBi	verified
Carbon steel reinforcing bar (secondary production route – scrap)	[turkey, spain, france, portugal]		7850.0	2016	EPD Carbon steel reinforcement bar (secondary production route - scrap), Sector average	EN15804+A1	BREG EN EPD000125, Issue 02	BRE	UK Cares (2020)	EN15804+A1	-	7850 kg/m3, 96% recycled steel	GaBi	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream data base	Verification
Carbon steel reinforcing bar (secondary production route – scrap)	[unitedKingdom, poland, turkey, spain, france, portugal]		7850.0	2016	EPD Carbon steel reinforcement bar (secondary production route - scrap), Sector average, UK cares	EN15804+A1	BREG EN EPD 000125	BRE	UK Cares	EN15804+A1	-	97.07% recycled steel, 7850 kg/m3	GaBi	verified
Cold formed aluminium sheet	[germany]		2720.0	2013	Cold-formed aluminium sheet for exterior applications, GDA (German Aluminium Association)	EN15804+A1	EPD-GDA-20130260-IBG1-EN	IBU	GAA	PCR Products of aluminium and aluminium alloys, 10/2012	Only with EN15804	2700 kg/m3	GaBi	verified



Galvanized steel staircase, spiral	[france]	Les fabricants pouvant utiliser les FDES collectives UDM-FFB sont les membres de l'Union des Métalliers . La liste complète des membres de l'Union des Métalliers peut être consultée sur le site www.metal-pro.org rubrique « Trouver un professionnel ». Afin de confirmer que leurs produits remplissent l'ensemble des conditions présentées dans le		2018	FDES	EN15804+A1	INIES_CESC20190128_112919, 16494	INIES	UNION DES METALLIERS	EN15804+A1	EN15804+A1	102.38 kg/m2	ecoinvent	verifié
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Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
		cadre de validité, les métalliers doivent produire une « attestation de conformité au cadre de validité », au sein de laquelle sont listés les produits concernés .												
Glass facade	[belgium]	Curtain wall Concept Wall® CW 60 – CW 60 HI		2020	EPD Curtain wall Concept Wall® CW 60 – CW 60 HI Declaration	EN15804+A1	EPD EUROPEAN ALUMINIUM 2020 – REYNAERS 14	European Aluminium	Reynaers	EAA Product Category Rules (PCR) for Aluminium Building Products – version of 30 January 2013	Only with EN15804	size: 3.6 x 7.2m, double glazing, 51.67 kg/m2	GaBi	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream data base	Verification
Glass wool/mineral wool insulation, acoustic partition roll	[unitedKingdom]	APR1200	18.0	2015	EPD Acoustic Partition Roll (APR1200) 50 and 65 mm, Isover Saint Gobain 2015	EN15804+A1	BREG EN EPD000072	BRE	Isover	EN15804+A1	-	L = 0.039W/mK, T: 50-65 mm, 18 kg/m3	ecoinvent	verified
Gypsum plaster board, fire resistant	[unitedKingdom]	Gyproc FireLine	843.0	2019	EPD 12.5mm Gyproc FireLine, ver. 2.0	EN15804+A1	S-P-00508, ver. 2.0	International EPD System	British Gypsum (2019)	PCR 2012:01 version 2.2 for Construction Products and CPC 54 construction services	Only with EN151404	12.5/15 mm, 843 kg/m3, A2 fire class, 10µ water vapour resistance	ecoinvent	verified
Gypsum plaster board, fire resistant, moisture resistant	[ireland]	CoreBoard	849.0	2023	EPD CoreBoard 19 mm	EN15804+A1, EN15804+A2	S-P-07660	International EPD System	Saint-Gobain Gyproc, Kingscourt plant	PCR 2019:14 version 1.11 for Construction products and Construction services	Only with EN15804	19 mm, 16.13 kg/m2, 849 kg/m3, fire resistance class A2-s1, d0	ecoinvent, GaBi	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
Gypsum plaster board, reinforced, water resistant, with square edges	[United Kingdom]	Glasroc H TILEBACKER	800.0	2014	EPD for Glasroc H TILEBACKER	EN15804+A1	S-P-00472	International EPD System	British Gypsum	PCR 2012:01 Construction Products and Construction services, ver. 1.2, IBU PCR Guidance Texts for Building-Related Products and services, Part B: Requirements on the EPD for Plasterboard version 1.5	Only with EN151404	1200x900x6/12.5 mm, 800 kg/m ³ , 10µ water resistance	ecoinvent	verified
Gypsum plaster board, tapered or square edges	[United Kingdom]	Gyproc WallBoard	675.0	2019	EPD for Gyproc WallBoard, ver. 2	EN15804+A1	S-P-00506, ver.2	International EPD System	British Gypsum (2019)	PCR 2012:01 version 2.2 for Construction Products	Only with EN151404	12.5 mm, 8.44 kg/m ² , 675 kg/m ³ , 10µ water vapour resistance	ecoinvent	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
Lightweight concrete block	[ireland]	Thermal Liteblock	1183.9323 467230442	2020	EPD of Thermal Liteblock	EN15804+A1	S-P-02442	International EPD System	Roadstone	PCR 2012:01 Construction products and construction services; version 2.33 (EN 15804:2012+A1:2013) and PCR 2012:01-Sub-PCR-G Concrete and concrete elements (EN 16757:2017) serve as the core PCR (Product Category Rules).	Only with EN15804	13N, 0.35 W/mK, 1183.93 kg/m3	ecoinvent	verified
Masonry mortars	[unitedKingdom, OCLEPD]			2022	EPD Masonry Mortars CPI Mortars Ltd	EN15804+A1, EN15804+A2	HUB-0009	EPD Hub	CPI Mortars Ltd	EPD Hub Core PCR version 1.0, 01.02.2022	Only with EN15804		ecoinvent	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
Metal framing components for gypsum plaster board	[unitedKingdom]	Gypframe	7750.0	2021	EPD Gypframe metal framing components for gypsum plasterboard, ver. 2	EN15804+A1	S-P-00808, ver. 2	International EPD System	British Gypsum Saint Gobain (2021)	PCR 2012:01 version 2.33 for Construction Products.	Only with EN15804	0.4-1.0 mm, 7750 kg/m3	ecoinvent	verified
Natural clay lime plaster	[unitedKingdom, OCLEPD]	Clime		2021	EPD Clime	EN15804+A1, EN15804+A2	S-P-04457	International EPD System	Armourcoat	PCR 2019:14. Construction Products. Version 1.1. Sub-PCR-A Mortars applied to a surface Services, Version 2.33, 2020-09-18	Only with EN15804		ecoinvent	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
Polystyrene grating for outdoor use	[france]	Caillebotis en polyester pour utilisation extérieure (mailles de 38mm*38 mm, hauteur porteur : 30 mm)		2022	MDEGD_FDES	EN15804+A1	INIES_DFBO2021124_094316, 32528	INIES	DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFAUT	EN15804+A1	EN15804+A1	17 kg/m2	ecoinvent	verified
Precast concrete paving products	[unitedKingdom]		2350.0	2017	EPD UK Manufactured 1 tonne of Generic Precast Concrete Paving Products (Blocks, Slabs, Channels and Kerbs) Produced by members of Interpave a product group of British Precast	EN15804+A1	EPD-BPC-20170094-CCD1-EN	IBU	BPCF	PCR Precast concrete components , 07/2014	Only with EN15804	2350 kg/m3	GaBi	verified
Precast concrete staircase, 10 steps	[france]	VD		2020	FDES	EN15804+A1	INIES_IESC2020113_104410, 24407	INIES	SORIBA	EN15804+A1	EN15804+A1	width. 140cm, 1422.6kg /m, CEM III/A	ecoinvent	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream data base	Verification
Precast concrete wall elements (solid, uninsulated), generic	[LOCAL]		2400.0	2018	One Click LCA	EN15804+A1	-	One Click LCA		EN15804+A1	-	C40/50 (5800/7300 PSI), 0% (typical) recycled binders in cement (400 kg/m3 / 24.97 lbs/ft3), incl. reinforcement	ecoinvent	internally
Profiled steel decking for composite floor slabs/decking	[United Kingdom, United Arab Emirates]	ComFlor 80 0.9mm steel structural floor deck		2018	EPD ComFlor 80 0.9mm steel structural floor deck	EN15804+A1	EPD-TS-2018-008	TATA Steel	Tata Steel	EN15804+A1	-	0.9mm sheet thickness, 11.35kg/m2	GaBi	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
Ready-mix concrete, normal strength, generic	[LOCAL]		2400.0	2020	One Click LCA	EN15804+A1, EN15804+A2	-	One Click LCA		EN15804+A1, EN15804+A2	-	C35/45 (5000/6500 PSI) with CEM II/B-V, 20% fly ash content (340 kg/m ³ ; 21.2 lbs/ft ³ total cement)	ecoinvent	internally
Red brick, average production, UK	[unitedKingdom]		1485.0	2019	EPD BDA Generic Brick, The Brick Development Association	EN15804+A1	BREG EN EPD000002, issue 04	BRE	Brick Development Association (BDA) Ltd (2019)	EN15804+A1	-	215 mm x 102.5 mm x 65 mm, 2.13 kg/unit, 1485 kg/m ³	ecoinvent	verified



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
Rock wool insulation panels	[unitedKingdom]	FLEXI 1200x600x100	33.0	2019	EPD ROCKWOOL® stone wool product: FLEXI 1200x600x100	EN15804+A1	-	-	ROCKWOOL, UK plant	EN15804+A1	-	L=0.037 W/mK, R=2.63 m ² k/W, 100 mm, 3.3 kg/m ² , 33 kg/m ³ , Lambda=0.037 W/(m.K)	ecoinvent	verified
Stainless steel handrail	[france]	Donnee par default		2018	MDEGD_FDES	EN15804+A1	INIES_DMAI20180529_140740, 8288	INIES	MDEGD	EN15804+A1	EN15804+A1	diam. 45mm	ecoinvent	verified
Steel doors	[germany]	ET 500 (Kipptor), SP 500 (Sporthallentore), N 500 (Schwingtor)		2019	EPD Doppelgaragentore /Sporthallentore	EN15804+A1	EPD-SPT-0.11.0	ift Rosenheim	Hörmann Legnica	PCR Teil A PCR-A-0.2:2018 und Profile für Fenster, Türen und Fassaden PCR-PR-2.1:2018	Only with EN15804	28.3 kg/m ²	GaBi	verified
Steel sheets, generic	[LOCAL]		7850.0	2018	One Click LCA	EN15804+A1, EN15804+A2	-	One Click LCA		EN15804+A1	-	20% recycled content, S235, S275 and S355	ecoinvent	internally



Resource name	Country	Product	Density	Year	Environment Data Source	Standard	EPD number	EPD program	Manufacturer	Product Category Rules (PCR)	Notes about PCR	Technical specification	Upstream database	Verification
Synthetic roofing membrane from FPO - PP	[germany]	BauderTHERMOFIN		2016	Oekobau.dat 2017-I, FPO Dach- und Dichtungsbahnen BauderTHERMOFIN Paul Bauder GmbH & Co. KG	EN15804+A1	EPD-BAU-20160221-IBC1-DE	IBU	Paul Bauder	PCR Dach- und Dichtungsbahnsysteme aus Kunststoffen und Elastomeren, 07/2014	-	1.934 kg/m ²	GaBi	verified
XPS insulation board	[unitedKingdom]	Roofboard Extra, Floorboard Extra, Laminating Board Extra	34.0	2021	EPD POLYFOAM Extra XPS, PolyFoam™ XPS Ltd	EN15804+A1	BREG EN EPD000082, issue 04	BRE	Polyfoam XPS Ltd (2021)	EN15804+A1	-	0.033 W/mK, 34 kg/m ³	ecoinvent	verified

