

London Square

# Holloway Park

RIBA Stage 3 – Whole Life Carbon Assessment for Phase 1



<b>Project Name</b>	Holloway Park
<b>Report Title</b>	RIBA Stage 3 – Whole Life Carbon Assessment for Phase 1
<b>Description</b>	Updated RIBA Stage 3 Whole Life Carbon Assessment
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<b>Prepared by</b>	Ara Nik
<b>Reviewed by</b>	Sam Luker
<b>Approved by</b>	Sam Luker
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## Table of Contents

<b>1</b>	<b>Executive summary</b>	<b>4</b>
1.1	Scope	4
1.2	Development description	4
1.3	Estimated Whole Life Carbon Emissions	5
<b>2</b>	<b>Introduction</b>	<b>6</b>
2.1	Development Description	6
2.2	Whole Life Carbon Assessment	6
<b>3</b>	<b>Methodology</b>	<b>6</b>
3.1	Assessment scope	6
3.2	Operational carbon emissions	6
3.3	Embodied carbon assessment and end-of-life emissions	6
3.4	Data sources	7
<b>4</b>	<b>Data Inputs</b>	<b>7</b>
4.1	Operational Carbon Assessment	7
4.2	Embodied carbon and end-of-life assessment	8
4.3	Reuse of existing materials on site	10
4.4	Demolition, Enabling works	10
4.5	End of life approach	11
4.6	Stage 3 - Carbon Reductions	11
<b>5</b>	<b>Results</b>	<b>11</b>
<b>6</b>	<b>Site Activities Emissions</b>	<b>24</b>
<b>7</b>	<b>Conclusion</b>	<b>24</b>



# 1 Executive summary

## 1.1 Scope

This document has been prepared on behalf of London Square in order to satisfy the planning condition for updated Whole Life Carbon Assessment prior to Sub-structure Works for the Proposed re-development of the former Holloway Prison. This report focuses on the First Phase of the development which is inclusive of Plots C, D & E.

This report establishes an updated RIBA Stage 3 Whole Life Carbon (WLC) assessment for the former Holloway Prison development, situated in Islington, London. The assessment has been carried out in line with the guidance provided by the Greater London Authority GLA in the Whole Life-Cycle Carbon Assessments guidance, March 2022. The study is established based on the WLC assessment carried out in the previous stages of the project and has been update to reflect the latest available information.

The present report has been prepared in line and in response to Planning condition 7 as outlined below:

Table 1 - Holloway Planning Condition 7

7	Notwithstanding the details approved, prior to the commencement of the demolition phase (Phase 0) an Updated Whole Life Carbon Assessment for that phase shall be submitted to and approved in writing by the Local Planning Authority.	Prior to commencement (including demolition)	Updated Whole Life Carbon Assessment
	Prior to commencement of sub-structure works for each subsequent phase of development, an Updated Whole Life Carbon Assessment for that phase shall be submitted to and approved in writing by the Local Planning Authority. The updated assessments shall include/address: <ul style="list-style-type: none"> <li>- Further carbon reduction quantification through the detailed design stage material selection and specification;</li> <li>- Completed GLA Draft Whole Life-Cycle Carbon Assessment</li> <li>- Details of how opportunities for retaining and refurbishing/re-purposing existing buildings, materials and other resources on site have been maximised to reduce the need for new materials;</li> </ul>	Prior to sub-structure works (Phase 1)	Updated Whole Life Carbon Assessment
		Prior to sub-structure works (Phase 2)	Updated Whole Life Carbon Assessment
		Prior to sub-structure works (Phase 3)	Updated Whole Life Carbon Assessment

- Details of life cycle of embodied carbon and finite resources relating to the enabling works stage and end of life approach;
  - The use of a consolidated delivery facility;
  - Details of the applicant’s Principals of Sustainable Procurement and details of specific measures being taken on the site for specification and sourcing of materials;
  - Consideration of end of life de-construction;
  - Cost premiums, supply chain limits and structural constraints for the proposal and Implications of Key Performance Indicators not being met; and
  - Updated targets for Bill of Materials
- The development shall be carried out strictly in accordance with the details so approved and no change therefrom unless otherwise specified in writing by the Local Planning Authority.

## 1.2 Development description

The Proposed development will involve the *'Phased comprehensive redevelopment including demolition of existing structures; site preparation and enabling works; and the construction of 985 residential homes including 60 extra care homes (Use Class C3), a Women’s Building (Use Class F.2) and flexible commercial floorspace (Use Class E) in buildings of up to 14 stores in height; highways/access works; landscaping; pedestrian and cycle connection, publicly accessible park; car (blue badge) and cycle parking; and other associated works.'*



### 1.3 Estimated Whole Life Carbon Emissions

Estimated Whole Life Carbon of phase one of the development is summarised in the table below:

Table 2 - Summary table of the Whole Life Carbon Emissions of Phase One of the Proposed Development (including grid decarbonisation).

Whole Life Carbon Scope	Whole Life Carbon Emissions
Plot C	16,455,736
Plot D	26,604,798
Plot E	10,203,136

The following Table 2 provides a summary of project's Whole Life Carbon Emissions as calculated at the end of stage 2 and the current design stage.

Table 3 - Comparative summary of the Whole Life Carbon Emissions of Phase One of the Proposed Development (including grid decarbonisation).

Whole Life Carbon Scope	Whole Life Carbon Emissions – Stage 3	Whole Life Carbon Emissions – Stage 2 (HOARE LEA Report)
Plot C	16,455,736	25,724,760
Plot D	26,604,798	29,142,806
Plot E	10,203,136	13,286,040

Furthermore, the following table provides a summary of project's performance against GLA's WLC benchmarks:

Table 4 - Project's performance against GLA's WLC benchmarks

Modules A1-A5	
GLA WLC Benchmark	<850
GLA WLC Benchmark - Aspirational	<500
Plot C - Pre Decarbonisation	1,098
Plot C - Post Decarbonisation	834
Plot D – Pre Decarbonisation	1,293
Plot D - Post Decarbonisation	1,176

Plot E – Pre Decarbonisation	1,202
Plot E - Post Decarbonisation	908
Modules B1-B5 + C1-C4	
GLA WLC Benchmark	<350
GLA WLC Benchmark - Aspirational	<300
Plot C - Pre Decarbonisation	89
Plot C - Post Decarbonisation	74
Plot D – Pre Decarbonisation	95
Plot D - Post Decarbonisation	89
Plot E – Pre Decarbonisation	138
Plot E - Post Decarbonisation	129
Modules A-C	
GLA WLC Benchmark	<1200
GLA WLC Benchmark - Aspirational	<800
Plot C - Pre Decarbonisation	1,986
Plot C - Post Decarbonisation	984
Plot D – Pre Decarbonisation	2,064
Plot D - Post Decarbonisation	1,329
Plot E – Pre Decarbonisation	2,226
Plot E - Post Decarbonisation	1,129



## 2 Introduction

AESG have been appointed to undertake an updated RIBA Stage 3 Whole Life Carbon (WLC) Assessment for the first phase of Project Holloway development in Islington, London, hereafter referred to as the Proposed Development. This assessment is established upon the WLC assessment carried out at RIBA Stage 2 by Hoare Lea and is aligned with guidance provided by the GLA in the Whole Life-Cycle Carbon Assessments guidance, March 2022.

### 2.1 Development Description

Proposed Development can be described as:

*'Phased comprehensive redevelopment including demolition of existing structures; site preparation and enabling works; and the construction of 985 residential homes including 60 extra care homes (Use Class C3), a Women's Building (Use Class F.2) and flexible commercial floorspace (Use Class E) in buildings of up to 14 stores in height; highways/access works; landscaping; pedestrian and cycle connection, publicly accessible park; car (blue badge) and cycle parking; and other associated works.'*

### 2.2 Whole Life Carbon Assessment

The aim of the present assessment is to assess the WLC for the Proposed Developments, defined as 'carbon emissions resulting from the construction and the use of a building over its entire life, including its demolition and disposal.' This assessment captures the operational carbon emissions for the Proposed Development from both regulated and unregulated energy use, as well as its embodied carbon emissions, i.e., emissions associated with raw material extraction, manufacture and transport of building materials, construction and the emissions associated with maintenance, repair, and replacement as well as dismantling, demolition, and eventual material disposal.

The above mentioned life cycle stages breakdown is in line with RICS Whole Life Carbon professional statement: Whole Life Carbon Assessment (WLC) for the Built Environment, released in 2017.

This guideline standardises WLC assessment and enhances consistency in outputs by providing guidance on implementing the broad appraisal methodology set out in EN 15978: Sustainability of Construction Works. The Greater London Authority have adopted the RICS WLC methodology in their guidance methodology for Whole Life Carbon assessment of referable planning applications.

## 3 Methodology

### 3.1 Assessment scope.

This assessment covers of the following sections:

- Total operational carbon emissions (regulated plus unregulated);
- Embodied carbon emissions; and any future potential carbon emissions 'benefits',
- Post end-of-life, including benefits from reuse and recycling of building structure and materials.

The assessment has been carried out for 2 different scenarios of:

- Pre-decarbonisation: considering typical materials with an average embodied carbon impact and considering a non-decarbonised grid.
- Post-decarbonisation: Considering material categories with lower embodied carbon impact and a decarbonised grid.

These scenarios have been defined to demonstrate the impact of material selection as well as grid decarbonisation on the whole life carbon of the project.

This assessment has been undertaken in line with the GLA guidance for undertaking WLC Assessments and therefore in line with the RICS Professional Statement: Whole Life Carbon Assessment for the Built Environment.

### 3.2 Operational carbon emissions

The operational carbon emissions for the WLC assessment have been determined following a combination of SAP calculations, a Passivhaus Planning Package (PHPP) assessment and TM54 modelling.

An area weighted approach has been applied to each plot in order to provide an indicative figure. This encompasses carbon emissions related to both regulated and unregulated energy uses, accumulated over a 60-year study period.

### 3.3 Embodied carbon assessment and end-of-life emissions

To assess the embodied carbon for the project, One Click LCA has been used as the Life Cycle Assessment (LCA) tool to make allocations for the anticipated materials quantities in an inventory analysis. Material input is carried out using materials that their associated Environmental Product Declarations (EPDs) information is available.

EPDs are produced by manufacturers and identify the carbon emissions of a product. By scheduling the materials proposed for the development, the overall carbon emissions can be approximated.



Due to limitations in the LCA tool’s material database, in cases where a specified material is not recorded in the database, the most similar datapoint in terms of material composition is selected instead.

In line with standard UK practice, the LCA process and results included by this report have been assessed in line with BS 15978:2011 and the RICS Professional Statement: Whole Life Carbon assessment for the built environment. All EPDs used have been produced in line with the requirements of BS EN 15804:2012. Therefore, each material has been assessed against the following lifecycle stage:

- A1-A3: Product stage
- A4: Material transportation to site
- A5: On site construction
- B4-B5: Replacement and maintenance
- C1-C4: End of life

Furthermore, in line with the GLA guidance, the assessment covers the following construction and building elements:

- Demolition
- Facilitating works
- Substructure
- Superstructure (frame, upper floors, roof, stairs and ramps, external walls, windows and external doors, internal walls and partitions, internal doors)
- Finishes
- Fittings, furnishings, and equipment
- Building services
- Prefabricated buildings and building units
- Work to existing building
- External works (hard and soft landscaping, fencing, fixtures, drainage, services) Life cycle assessment impacts.

This assessment will report on the impact of above-mentioned elements throughout different lifecycle stages of the development reports on the embodied carbon of the development as ‘global warming potential’ with the annotation ‘CO2 equivalent (CO2e)’.

It must be highlighted that to ensure Stage 3 WLC assessment is aligned with the WLC assessment carried out in previous stages, the same EPDs and data points have been used where applicable and the calculations are updated based the latest information received from the design team.

### 3.4 Data sources

Considering the current project stage (RIBA Stage 3) and limitations regarding the information available of quantity and accurate composition of some of the materials as well as software limitations, a flexible approach is through utilising a dataset of product specific EPD’s and more generic data calculated within the LCA tool.

Table 5 - Types of data required for a WLC assessment.

Data points	Data Source
<b>Bill of Quantities</b>	Bill of Quantities can be used for calculation of uncertain quantities which are not product specific, however it has to be noted that often an allowance is made at early design stages which may reduce accuracy. This information must be updated at different design stages in order to provide and updated WLC.
<b>IES-VE Model</b>	IES-VE model can help in determining the quantity of main building elements but there is limited functionality in calculating the volume of materials. Furthermore, IES model outputs can be used to generate energy consumption data.
<b>Architectural/Structural Drawings and Area schedule</b>	Information provided by design team has been used as reference where required.
<b>Relevant standards and benchmarks</b>	Where sufficient information is not available, for example regarding MEP services, relevant standards, guidelines and benchmarks are used to estimate material quantity and composition.

## 4 Data Inputs

This section provides further information on the input parameters used in the present Whole Life Carbon assessment.

### 4.1 Operational Carbon Assessment

The following table documents the Operational Carbon emissions estimated as part of the Hoare Lea Energy Strategy.

Table 6 - Operational energy estimation

Operational Carbon Data points	Regulated and Unregulated kWh (annual) (60-year)
Plot C	1139760
Plot D	1267427
Plot E	676498.9



Water consumption has been confirmed by the Mechanical engineer as being based upon CIBSE Guide G (based upon litres/per day per number of bedrooms) and has estimated the following breakdown:

- Plot C – 21,000 litres/day (l/d)
- Plot D – 24,000 litres/day (l/d)
- Plot E – 11,000 litres/day (l/d)

## 4.2 Embodied carbon and end-of-life assessment.

Table 7 lists the building elements covered by the assessment, in line with the RICS Professional Statement: Whole Life Carbon assessment for the built environment.

The London Square Bill of Quantities dated July 2023 and architectural drawings have been used as the main source to inform this study.

For the project elements that were not covered within the London Square Bill of Quantities dated July 2023, estimations based on design intent and information available has been used to inform the assessment at this stage of the design process.

Table 7 - Data used in the embodied carbon assessment

No.	Building Part/ Element Group	Building Element	Basis for Information
-	Demolition	0.1 -Toxic/ hazardous/ contaminated material treatment	An allowance for contaminated land removal and treatment has not been provided for the Proposed Development.
		0.2 Major demolition works	Separate allowances for site excavation and demolition works have been included in the assessment using OneClick LCA software average deconstruction and demolition scenario. Furthermore, up to date information received based on the current site activities have been assessed and their carbon impact has been calculated. However since the site work is still ongoing, these values have been presented separately under section 6 of this report.
0	Facilitating works	0.3 & 0.5 Temporary/ Enabling Works	The available information as per London Square July 2023 BoQ (RIBA Stage 3) has been used in the assessment.

No.	Building Part/ Element Group	Building Element	Basis for Information
		0.4 Specialist groundworks	The available information as per London Square July 2023 BoQ (RIBA Stage 3) has been used in the assessment. Furthermore, up to date information received based on the current site activities have been assessed and their carbon impact has been calculated. However since the site work is still ongoing, these values have been presented separately under section 6 of this report.
1	Substructure	1.1 Substructure	The available information on material quantity and composition as per London Square July 2023 BoQ (RIBA Stage 3) has been used in the assessment.
2	Superstructure	2.1 Frame	The available information on material quantity and composition as per London Square July 2023 BoQ (RIBA Stage 3) has been used in the assessment.
		2.2 Upper floors incl. balconies	
		2.3 Roof	
		2.4 Stairs and ramps	
		2.5 External walls	
		2.6 Windows and external Doors	
		2.7 Internal walls and Partitions	
		2.8 Internal doors	
3	Finishes	3.1 Wall finishes	The available information on material quantity and composition as per London Square July 2023 BoQ (RIBA Stage 3) has been used in the assessment.
		3.2 Floor finishes	
		3.3 Ceiling finishes	
4	Fittings, furnishings, and equipment (FF&E)	4.1 Fittings, furnishings & equipment incl. building-related* and non-building-related**	The quantum of FFE for the residential apartments are gathered from the London Square July 2023 BoQ and uses benchmark data from previous comparable assessments for any missing information.





No.	Building Part/ Element Group	Building Element	Basis for Information
			The quantum of sanitaryware were calculated based on the area schedule and occupancy, with EPD's matched to the fittings proposed to be installed. FF&E is not applicable to the non-residential uses as these spaces are built out to a shell-only speculative standard and the detailed use types are unknown.
5	Building services/MEP	5.1–5.14 Services incl. building-related* and nonbuilding-related**	Building services data uses data provided from the Building Services engineers which align with the proposed services strategy for the project. The lengths of duct's, electrical distribution and water distribution were calculated on a m2 GIA basis using in-built EPD within OneClick LCA.
6	Prefabricated Buildings and Building Units	6.1 Prefabricated buildings and building units	No prefabricated elements are applicable.
7	Work to Existing Building	7.1 Minor demolition and alteration works	No minor works were applicable.
8	External works	8.1 Site preparation works	The available information on material quantity and composition as per London Square July 2023 BoQ plan (RIBA Stage 3) has been used in the assessment.
		8.2 Roads, paths, paving and surfacing	Data for roads, paths, paving, and surfacing is based on details provided from the London Square July 2023 BoQ.
		8.3 Soft landscaping, planting, and irrigation systems	The available information as per London Square July 2023 BoQ (RIBA Stage 3) and T1 landscaping package issued on 10 <sup>th</sup> February 2023 have been used in the assessment.
		8.4 Fencing, railings, and walls	Due to the early stage of the design (RIBA Stage 3) this information is not yet available and as such has not been included in the assessment.
		8.5 External fixtures	Due to the early stage of the design (RIBA Stage 3) this information is not yet available and as such has not been included in the assessment.
		8.6 External drainage	Due to the early stage of the design (RIBA Stage 3) limited information is available.

No.	Building Part/ Element Group	Building Element	Basis for Information
			The available information on material quantity and composition as per London Square July 2023 BoQ (RIBA Stage 3) has been used in the assessment.
		8.7 External services	Due to the early stage of the design (RIBA Stage 3) this information is not yet available and as such has not been included in the assessment.
		8.8 Minor building works and ancillary buildings	
*	Building-related items: Building-integrated technical systems and furniture, fittings and fixtures built into the fabric. Building-related MEP and FF&E typically include the items classified under Shell and core and Category A fit-out.		
**	Non-building-related items: Loose furniture, fittings and other technical equipment like desks, chairs, computers, refrigerators, etc. Such items are usually part of Category B fit-out.		

A full list of product declarations used is given in the Appendix A.

Table 8 further outlines the information and data sources that have been used in different life cycle stages of the development.

Table 8 - The Life Cycle Modules included in the assessment and commentary on the data source

Module	Description	Commentary of Data Source
A1-A3 Construction Materials	Raw material supply (A1) includes emissions generated when raw materials are taken from nature, transported to industrial units for processing and processed. Loss of raw material and energy are also taken into account. Transport impacts (A2) include exhaust emissions resulting from the transport of all raw materials from suppliers to the manufacturer's production plant as well as impacts of production of fuels. Production impacts (A3) cover the manufacturing of the production materials and fuels used by machines, as well as handling of waste formed in the production processes at the manufacturer's production plants until end-of-waste state.	EPD's which align with the exact product (where known) or the most applicable similar product has been considered.



Module	Description	Commentary of Data Source
A4 Transportation to site	A4 includes exhaust emissions resulting from the transport of building products from manufacturer’s production plant to building site as well as the environmental impacts of production of the used fuel.	Where available, case specific transport distances were used. Other transport distances were estimated based on typical average transport distances each material provided by OneClick LCA.
A5 Construction/ installation process	A5 covers the exhaust emissions resulting from using energy during the site operations, the environmental impacts of production processes of fuel and energy and water as well as handling of waste until the end-of-waste state	Due to lack of site-specific construction data, the climate zone average construction impact was used based on OneClick LCA data scenario.
B1-B5 Maintenance and material replacement	The environmental impacts of maintenance and material replacements (B1-B5) include environmental impacts from replacing building products after they reach the end of their service life. The emissions cover impacts from raw material supply, transportation, and production of the replaced new material as well as the impacts from manufacturing the replaced material and handling of waste until the end-of-waste state.	Due to lack of accurate information at this stage, EPD and OneClick LCA data points were used
B6 Energy use	The considered use phase energy consumption (B6) impacts include exhaust emissions from any building level energy production as well as the environmental impacts of production processes of fuel and externally produced energy. Energy transmission losses are also considered.	Energy consumption taken from the Part L Energy assessment calculations for the project, in line with GLA requirements.
B7 Water use	The considered use phase water consumption (B7) impacts include the environmental impacts of production processes of fresh water and the impacts from wastewater treatment.	Water consumption has been based on the CIBSE Guide G estimated water consumptions (liters/day per number of bedrooms).
C1-C4 Deconstruction	The impacts of deconstruction include impacts for processing recyclable	Due to lack of detailed information, default OneClick

Module	Description	Commentary of Data Source
	construction waste flows for recycling (C3) until the end-of-waste stage or the impacts of pre-processing and landfilling for waste streams that cannot be recycled (C4) based on type of material. Additionally, deconstruction impacts include emissions caused by waste energy recovery.	LCA’s values have been used for the present assessment.
D External impacts/end-of-life benefits	External benefits for re-used or recycled material types include the positive impact of replacing virgin-based material with recycled material and the benefits of the energy which can be recovered from the materials.	Due to lack of detailed information, default OneClick LCA’s values have been used for the present assessment.

### 4.3 Reuse of existing materials on site

As outlined within Hoare Lea’s previous reports, previous work undertaken included a pre-demolition audit looking at the existing materials and quantities on site to see what materials could be re-used. The audit confirmed that 99.55% of material would be recycled. London Square’s aim is to re-use the demolition waste on-site and not to transfer any waste off-site.

Crushed brickwork on site is being blended with crushed concrete to provide a 6F2 specification. The brick and concrete crushed material are blended to provide a total material grade sufficient for use as a piling platform. The rest of the bricks on site are kept and crushed for general fill use due to excavations infills and assisting of building up any required levels across the approved scheme.

All concrete is crushed from existing foundations and superstructures and kept on site for use for piling mats / building up of new road levels.

The intention is to store the crushed concrete for future use relating to the structural groundworks for the development. The demolition materials are crushed and screened on site to provide a clean inert crush material (6F2 recycled capping or similar) which can be re-used for in the groundworks contract and to provide a capping layer across the site. 6F2 recycled capping material is stockpiled on site for future use.

### 4.4 Demolition, Enabling works

The updated calculations were factored in the carbon emissions associated with demolition and enabling works. The emissions associated with demolition have been calculated based on the pre-demolition audit and the GIA of the existing buildings. These have been presented separately in Table 13 at the end of this report.



The emissions associated with the enabling works have been calculated using the bill of quantities and the typical values within OneClick LCA.

#### 4.5 End of life approach

The end-of-life scenarios have been calculated using OneClick LCA’s end of life scenarios as these represent the most realistic carbon figures (and probably worst case given the likely change in technology in 60 years) for the materials at end of life as illustrated in Table 8. However, the building has been designed with longevity and flexibility in mind to maximise the likelihood that the building will be in use for as long as possible. Furthermore, elements of the building have been designed for future disassembly to ensure that materials maintain their environmental and economic value. Finally, a log of all of the building materials will be kept, with the inclusion of material passports where available, to maximise the reuse of materials at end of life.

Table 9 – End of life scenarios

Material group	End of life scenario	Materials included	C3 – C4, waste processing and landfilling	D, recycling benefits
Mineral building materials	Recycling for ground works	Concrete, Cement, Bricks, Porcelain, Plaster, Clay products, Stone, Ceramics, Asphalt	C3: Construction waste preparation for recycling	Recycling benefit from replacing the primary gravel
Metals	Metal preparation and recycling	Aluminium, Steel, Stainless steel, Galvanized steel, Copper coated, Copper uncoated, Brass, Zinc, Lead	C3: Metal waste preparation	Recycling benefits for replacing virgin metal
Biobased materials with heating value	Incineration and energy recovery	Wood, Wood products	C3: Construction waste incineration for energy recovery	Recovered energy
Other materials with heating value	Incineration and energy recovery	Plastics	C3: Construction waste incineration for energy recovery	Recovered energy
Other materials that can be landfilled in construction waste site	Disposal / landfilling of inert material	Coatings, Synthetic materials, Panels, and boards, Insulating materials, Glass, Window, and façade components	Disposal of inert construction waste	-

#### 4.6 Stage 3 - Carbon Reductions

The following measures to reduce whole life carbon workshopped with the design team have been included within this revised report and are detailed below:

- Maximisation of the GGBS cement content within columns and slabs
- Concrete slab of intermediate floors reduced from 250mm to 225mm
- Aggregates for concrete to contain up to 20% of recycled content
- Recycled content of Rebar >90%
- Improved Woven vinyl carpet tile specification
- Improved aluminium window spec
- Reduction in precast concrete, changing to Glass Reinforced Concrete
- Leaner fabric within the facades
- Cut and fill of all excavation material
- Change from a dry to a liquid screed (from 75mm to 50mm)

These have all been factored into the revised calculations and are illustrated in the Post Decarbonisation Scenario results illustrated in the following sections. These strategies have been advised taking into consideration the impact that cost premiums, supply chain limits and structural constraints could have on carbon emissions for the development.

### 5 Results

The following pages provide the summary of the estimated Whole Life Carbon Emissions of phase one of the development (inclusive of plots C, D and E) at RIBA Stage 3.

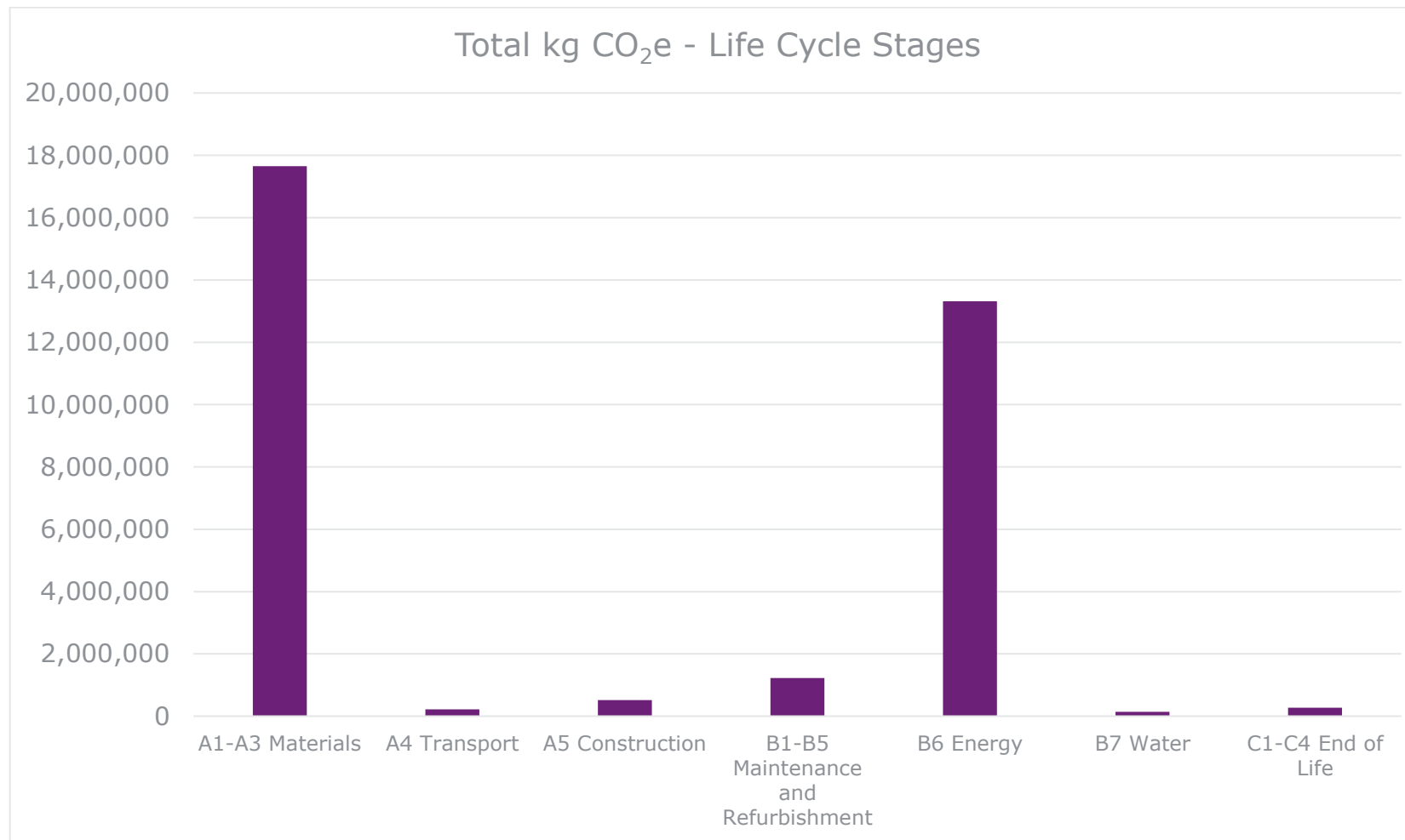
For each of the blocks the results of WLC assessment carried out for the “Pre-decarbonisation Scenario” and “Post decarbonisation Scenario” have been presented.

The Pre-decarbonisation Scenario represents the business-as-usual case where low carbon impact materials and decarbonisation of the grid has not been taken into consideration. On the other hand, the Post Decarbonisation Scenario represents the reduced WLC of the project based on decarbonisation strategies that have been adopted by the project and explained in the previous sections.



Table 10 - Plot C - WLC emissions for each lifecycle module – Pre Decarbonisation

Global warming (GWP) grouped by classification breakdown										
Category	A1-A3 Materials	A4 Transport	A5 Construction	B1-B5 Maintenance and Refurbishment	B6 Energy	B7 Water	C1-C4 End of Life	Total kg CO2e	Biogenic carbon storage kg CO2e bio	D External Impacts
Foundation, sub-surface, basement and retaining walls	1,559,608	7,852	0	0	0	0	17,571	1,585,031	0	-652,000
External walls and facade	290,058	3,551	0	564	0	0	6,002	300,175	1	-59,900
Columns and load-bearing vertical structures	2,214,621	86,187	0	0	0	0	36,155	2,336,963	0	-390,000
Internal walls and non-bearing structures	1,048,889	1,316	0	0	0	0	12,843	1,063,048	12,300	-3,050
Floor slabs, ceilings, roofing decks, beams and roof	2,742,423	102,617	0	143,088	0	0	56,103	3,044,231	0	-491,000
Other structures and materials	318,508	306	0	30,424	0	0	8,047	357,285	45	-112,000
Windows and doors	901,961	750	0	89,068	0	0	4,181	995,960	91,500	-5,480
Finishes and coverings	173,877	212	0	395,812	0	0	75,220	645,121	0	-37,600
Materials and constructions for external areas	1,518,037	3,107	0	0	0	0	5,885	1,527,029	0	-32,400
Building systems and installations	6,882,394	12,638	0	562,556	0	0	50,916	7,508,504	0	-2,400,000
Construction site scenarios	0	0	515,131	0	0	0	0	515,131	0	0
Electricity use	0	0	0	0	13,312,587	0	0	13,312,587	0	0
Total water consumption	0	0	0	0	0	137,970	0	137,970	0	0
<b>Total kg CO2e</b>	<b>17,650,375</b>	<b>218,537</b>	<b>515,131</b>	<b>1,221,511</b>	<b>13,312,587</b>	<b>137,970</b>	<b>272,923</b>	<b>33,329,034</b>	<b>103,846</b>	<b>-4,183,430</b>



### Global warming kg CO<sub>2</sub>e - Classifications

- Electricity use - 39.9%
- Building systems and installations - 22.5%
- Floor slabs, ceilings, roofing decks, beams and roof - 9.1%
- Columns and load-bearing vertical structures - 7.0%
- Foundation, sub-surface, basement and retaining walls - 4.8%
- Materials and constructions for external areas - 4.6%
- Internal walls and non-bearing structures - 3.2%
- Windows and doors - 3.0%
- Finishes and coverings - 1.9%
- Other classifications - 3.9%

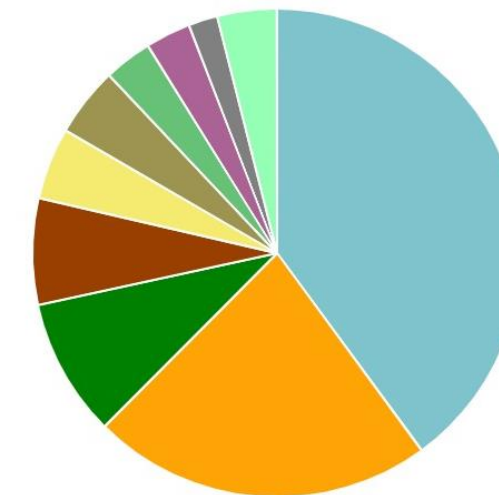


Figure 1- WLC per lifecycle stage (left), WLC per RICS category (right) – Plot C: Pre Decarbonisation

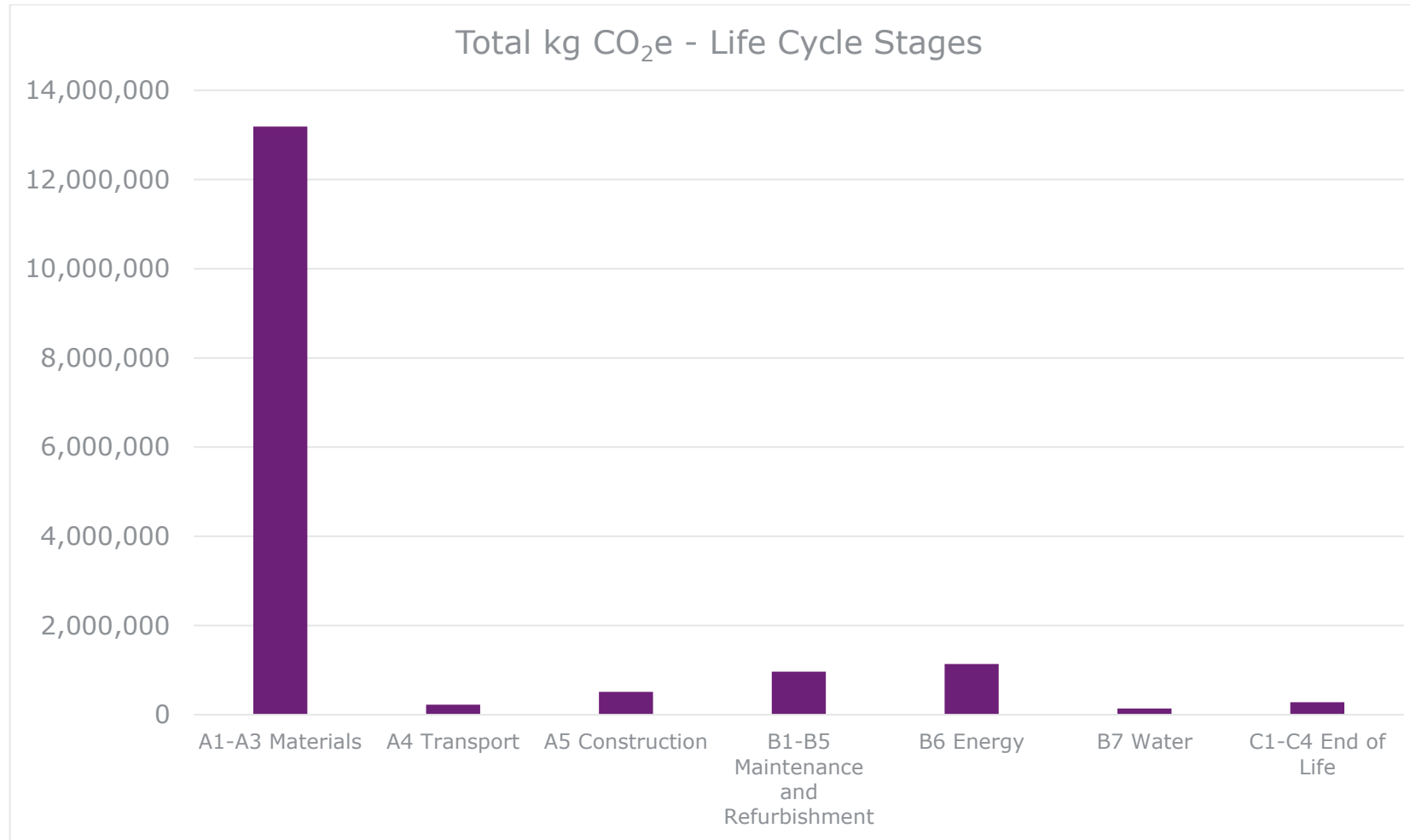
Table 11 - Project's performance against GLA's WLC benchmarks – Plot C: Pre-Decarbonisation

Project's performance against GLA's WLC benchmarks				
Modules	A1-A5	B1-B5	C1-C4	A-C
GLA Embodied Carbon Benchmark	850	350		1,200
GLA Embodied Carbon Aspirational Benchmark	500	300		800
Embodied Carbon (kgCO <sub>2</sub> e)	18,487,889	1,494,434		33,432,880
Embodied Carbon/ m <sup>2</sup> of GIA (kgCO <sub>2</sub> e/m <sup>2</sup> )	1,098	89		1,986



Table 12 - Plot C - WLC emissions for each lifecycle module – Post Decarbonisation

Global warming (GWP) grouped by classification breakdown										
Category	A1-A3 Materials	A4 Transport	A5 Construction	B1-B5 Maintenance and Refurbishment	B6 Energy	B7 Water	C1-C4 End of Life	Total kg CO2e	Biogenic carbon storage kg CO2e bio	D External Impacts
Foundation, sub-surface, basement and retaining walls	915,080	7,852	0	0	0	0	17,571	940,503	0	-652,000
External walls and facade	290,058	3,551	0	564	0	0	6,002	300,175	1	-59,900
Columns and load-bearing vertical structures	927,406	86,224	0	0	0	0	36,171	1,049,802	0	-390,000
Internal walls and non-bearing structures	145,769	1,231	0	0	0	0	12,009	159,010	12,300	-3,050
Floor slabs, ceilings, roofing decks, beams and roof	1,391,877	102,617	0	143,088	0	0	56,103	1,693,685	0	-491,000
Other structures and materials	274,010	330	0	30,424	0	0	8,047	312,811	45	-112,000
Windows and doors	336,303	650	0	89,068	0	0	3,396	429,417	91,500	-5,480
Finishes and coverings	144,364	212	0	307,271	0	0	75,079	526,925	0	-37,600
Materials and constructions for external areas	1,937,330	10,851	0	0	0	0	16,913	1,965,094	0	-32,400
Building systems and installations	6,826,647	12,598	0	395,317	0	0	50,892	7,285,454	0	-2,400,000
Construction site scenarios	0	0	515,131	0	0	0	0	515,131	0	0
Electricity use	0	0	0	0	1,139,760	0	0	1,139,760	0	0
Total water consumption	0	0	0	0	0	137,970	0	137,970	0	0
<b>Total kg CO2e</b>	<b>13,188,845</b>	<b>226,117</b>	<b>515,131</b>	<b>965,732</b>	<b>1,139,760</b>	<b>137,970</b>	<b>282,183</b>	<b>16,455,736</b>	<b>103,846</b>	<b>-4,183,430</b>



### Global warming kg CO<sub>2</sub>e - Classifications

- Electricity use - 46.5%
- Building systems and installations - 25.4%
- Materials and constructions for external areas - 6.9%
- Floor slabs, ceilings, roofing decks, beams and roof - 5.9%
- Columns and load-bearing vertical structures - 3.7%
- Foundation, sub-surface, basement and retaining walls - 3.3%
- Finishes and coverings - 1.8%
- Construction site scenarios - 1.8%
- Windows and doors - 1.5%
- Other classifications - 3.2%

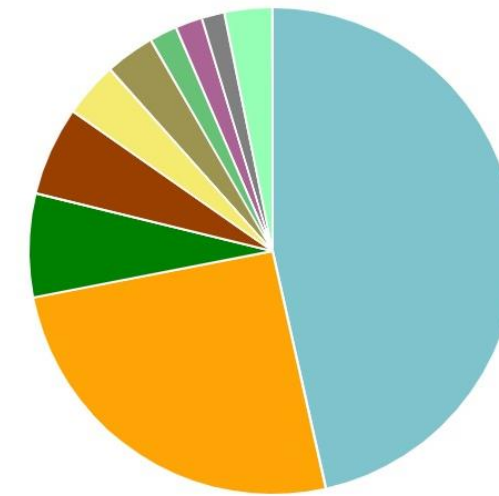


Figure 2- WLC per lifecycle stage (left), WLC per RICS category (right) – Plot C: Post Decarbonisation

Table 13 - Project's performance against GLA's WLC benchmarks – Plot C: Post Decarbonisation

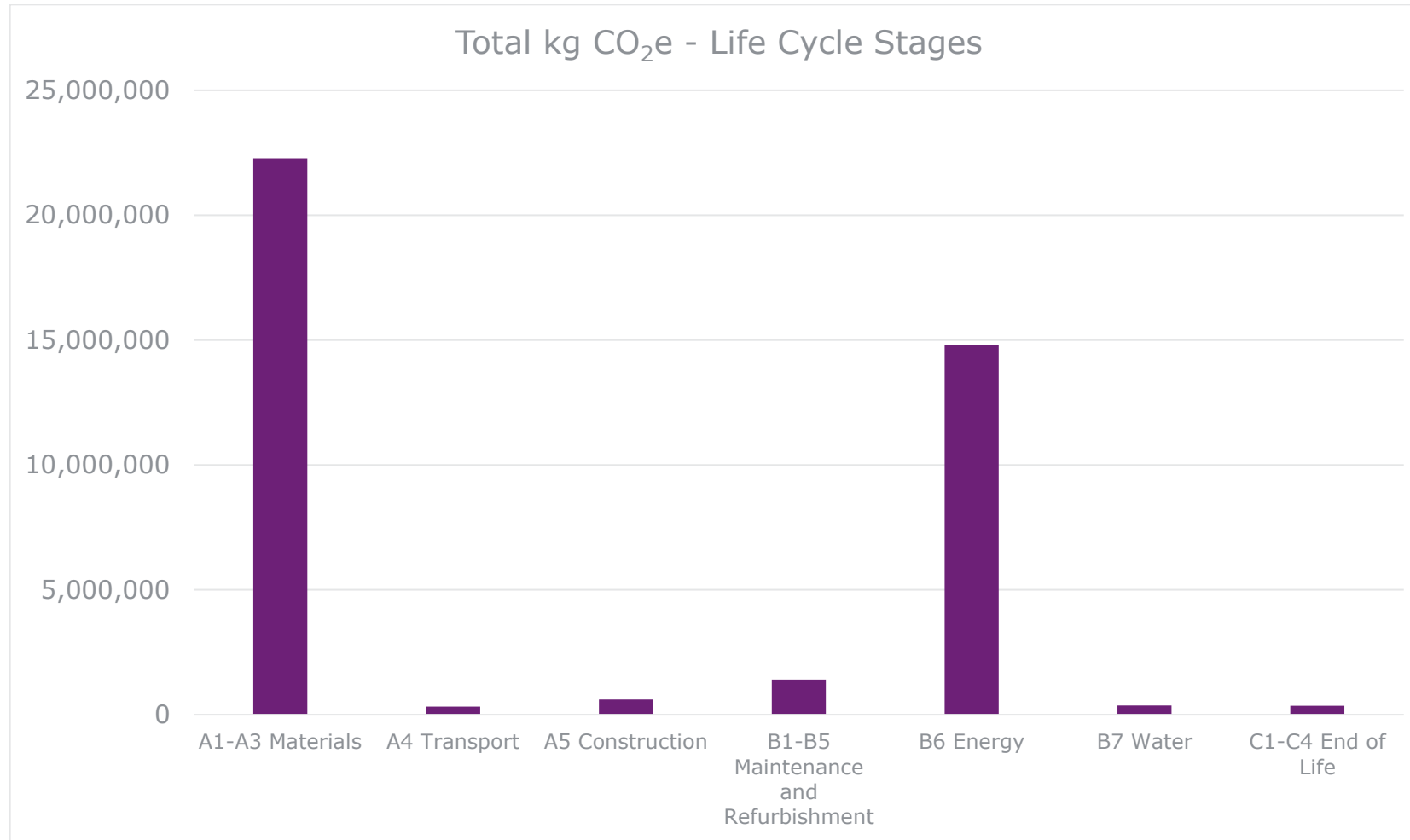
Project's performance against GLA's WLC benchmarks				
Modules	A1-A5	B1-B5	C1-C4	A-C
GLA Embodied Carbon Benchmark	850	350		1,200
GLA Embodied Carbon Aspirational Benchmark	500	300		800
Embodied Carbon (kgCO <sub>2</sub> e)	14,033,939	1,247,915		16,559,584
Embodied Carbon/ m <sup>2</sup> of GIA (kgCO <sub>2</sub> e/m <sup>2</sup> )	834	74		984



Table 14 - Plot D - WLC emissions for each lifecycle module – Pre Decarbonisation

Global warming (GWP) grouped by classification breakdown										
Category	A1-A3 Materials	A4 Transport	A5 Construction	B1-B5 Maintenance and Refurbishment	B6 Energy	B7 Water	C1-C4 End of Life	Total kg CO2e	Biogenic carbon storage kg CO2e bio	D External Impacts
Foundation, sub-surface, basement and retaining walls	3,277,893	24,978	0	0	0	0	175,622	3,478,493	0	-985,000
External walls and facade	294,614	3,900	0	757	0	0	6,142	305,412	1	-64,400
Columns and load-bearing vertical structures	1,875,504	163,036	0	0	0	0	68,393	2,106,933	0	-682,000
Internal walls and non-bearing structures	194,264	1,614	0	0	0	0	15,492	211,370	14,600	-4,920
Floor slabs, ceilings, roofing decks, beams and roof	1,525,099	122,464	0	150,044	0	0	68,956	1,866,563	0	-544,000
Other structures and materials	266,269	225	0	37,044	0	0	8,958	312,497	73	-121000
Windows and doors	467,791	879	0	110,491	0	0	4,759	583,920	120,000	-5,570
Finishes and coverings	204,370	691	0	347,440	0	0	79,741	632,242	91,400	-88400
Materials and constructions for external areas	7,809,641	142,042	0	0	0	0	203,719	8,155,402	0	-2,720,000
Building systems and installations	8,534,724	15,836	0	554,661	0	0	64,290	9,169,511	0	-3030000
Construction site scenarios	0	0	604,295	0	0	0	0	604,295	0	0
Electricity use	0	0	0	0	14,803,759	0	0	14,803,759	0	0
Total water consumption	0	0	0	0	0	363,915	0	363,915	0	0
<b>Total kg CO2e</b>	<b>24,450,168</b>	<b>475,667</b>	<b>604,295</b>	<b>1,200,437</b>	<b>14,803,759</b>	<b>363,915</b>	<b>695,800</b>	<b>42,594,312</b>	<b>226,074</b>	<b>-8,245,290</b>





### Global warming kg CO<sub>2</sub>e - Classifications

- Electricity use - 36.9%
- Building systems and installations - 22.8%
- Columns and load-bearing vertical structures - 11.0%
- Floor slabs, ceilings, roofing decks, beams and roof - 9.0%
- Materials and constructions for external areas - 5.1%
- Windows and doors - 3.5%
- Internal walls and non-bearing structures - 3.1%
- Finishes and coverings - 2.4%
- Foundation, sub-surface, basement and retaining walls - 2.2%
- Other classifications - 4.0%

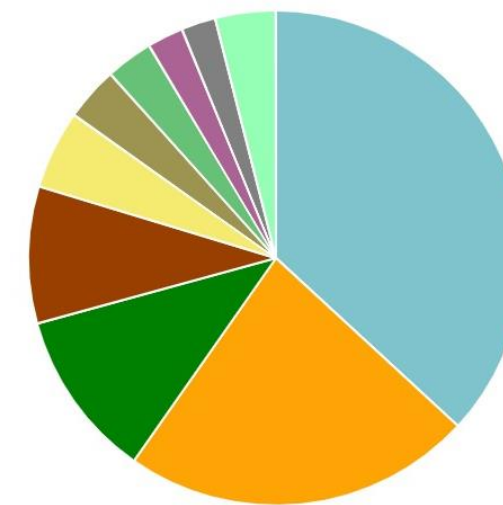


Figure 3- WLC per lifecycle stage (left), WLC per RICS category (right) – Plot D: Pre Decarbonisation

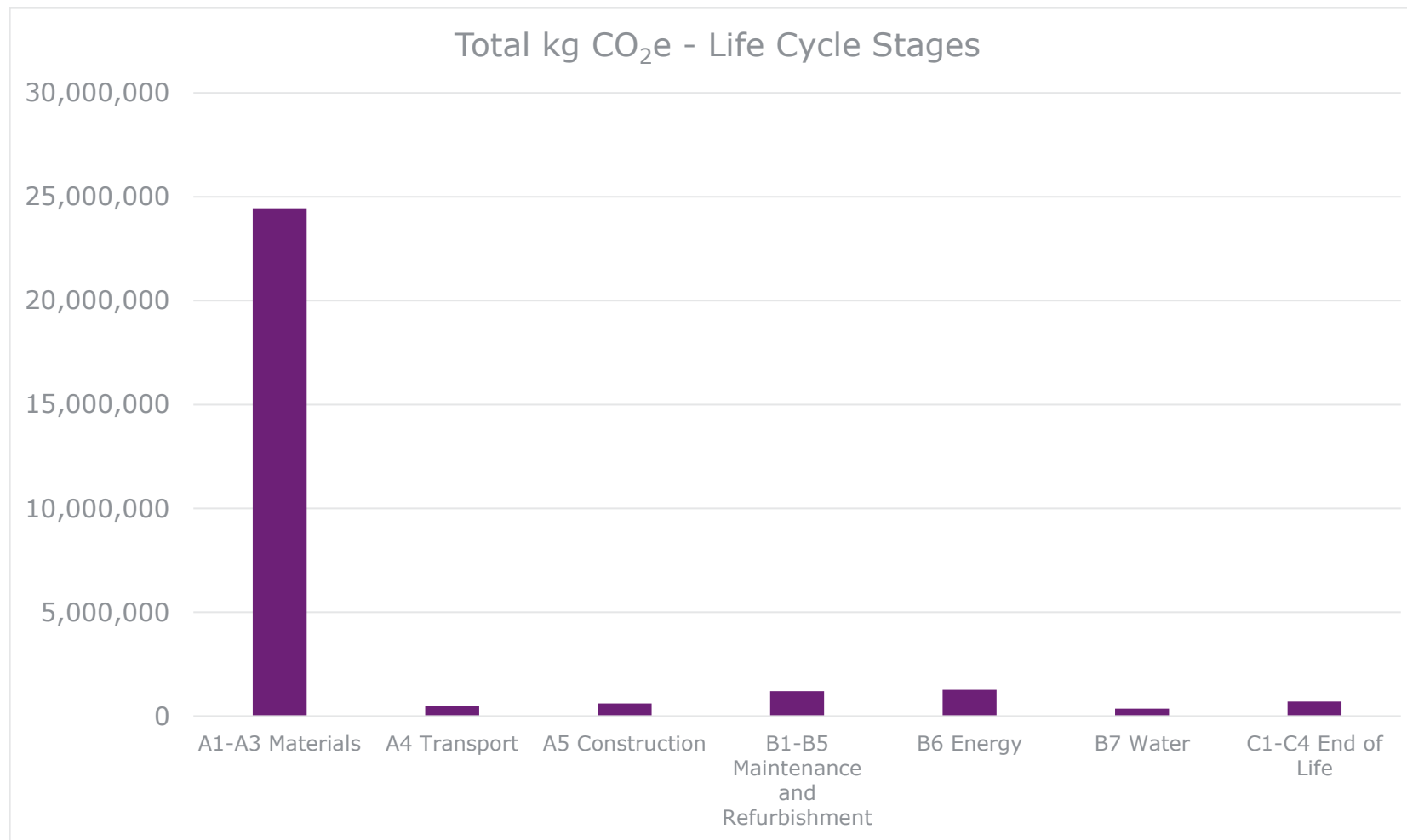
Table 15 - Project's performance against GLA's WLC benchmarks – Plot D: Pre Decarbonisation

Project's performance against GLA's WLC benchmarks				
Modules	A1-A5	B1-B5	C1-C4	A-C
GLA Embodied Carbon Benchmark	850	350		1,200
GLA Embodied Carbon Aspirational Benchmark	500	300		800
Embodied Carbon (kgCO <sub>2</sub> e)	25,758,204	14,650,994		41,102,998
Embodied Carbon/ m <sup>2</sup> of GIA (kgCO <sub>2</sub> e/m <sup>2</sup> )	1,293	95		2,064



Table 16 - Plot D - WLC emissions for each lifecycle module – Post Decarbonisation

Global warming (GWP) grouped by classification breakdown										
Category	A1-A3 Materials	A4 Transport	A5 Construction	B1-B5 Maintenance and Refurbishment	B6 Energy	B7 Water	C1-C4 End of Life	Total kg CO2e	Biogenic carbon storage kg CO2e bio	D External Impacts
Foundation, sub-surface, basement and retaining walls	882,850	7,626	0	0	0	0	8,910	899,386	0	-79,900
External walls and facade	294,614	3,900	0	757	0	0	6,142	305,412	1	-64,400
Columns and load-bearing vertical structures	4,189,308	163,036	0	0	0	0	68,393	4,420,737	0	-738,000
Internal walls and non-bearing structures	1,227,215	1,711	0	0	0	0	16,447	1,245,373	14,600	-4,960
Floor slabs, ceilings, roofing decks, beams and roof	3,252,508	122,464	0	150,044	0	0	68,956	3,593,972	0	-585,000
Other structures and materials	266,269	225	0	37,044	0	0	8,958	312,497	73	-121,000
Windows and doors	1,295,040	1,025	0	110,491	0	0	5,906	1,412,463	120,000	-5,880
Finishes and coverings	282,970	747	0	558,946	0	0	104,491	947,154	91,400	-75,000
Materials and constructions for external areas	2,050,097	4,217	0	0	0	0	8,341	2,062,655	0	-43,700
Building systems and installations	8,534,724	15,836	0	554,661	0	0	64,290	9,169,511	0	-3,030,000
Construction site scenarios	0	0	604,295	0	0	0	0	604,295	0	0
Electricity use	0	0	0	0	1,267,427	0	0	1,267,427	0	0
Total water consumption	0	0	0	0	0	363,915	0	363,915	0	0
<b>Total kg CO2e</b>	<b>22,275,597</b>	<b>320,788</b>	<b>604,295</b>	<b>1,411,943</b>	<b>1,267,427</b>	<b>363,915</b>	<b>360,834</b>	<b>26,604,798</b>	<b>226,074</b>	<b>-4,747,840</b>



### Global warming kg CO<sub>2</sub>e - Classifications

- Electricity use - 34.8%
- Building systems and installations - 21.5%
- Materials and constructions for external areas - 19.1%
- Foundation, sub-surface, basement and retaining walls - 8.2%
- Columns and load-bearing vertical structures - 4.9%
- Floor slabs, ceilings, roofing decks, beams and roof - 4.4%
- Finishes and coverings - 1.5%
- Construction site scenarios - 1.4%
- Windows and doors - 1.4%
- Other classifications - 2.8%

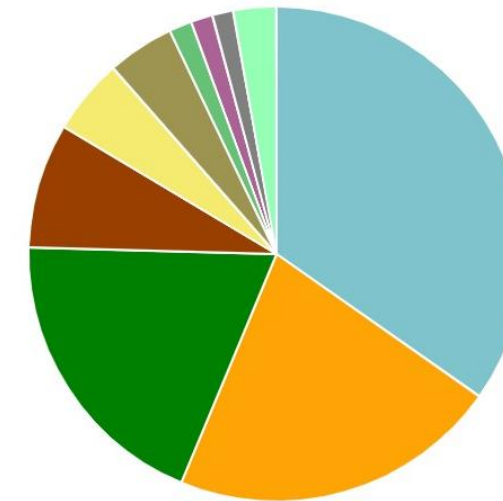


Figure 4- WLC per lifecycle stage (left), WLC per RICS category (right) – Plot D: Post Decarbonisation

Table 17 - Project's performance against GLA's WLC benchmarks – Plot D: Post Decarbonisation

Project's performance against GLA's WLC benchmarks				
Modules	A1-A5	B1-B5	C1-C4	A-C
GLA Embodied Carbon Benchmark	850	350		1,200
GLA Embodied Carbon Aspirational Benchmark	500	300		800
Embodied Carbon (kgCO <sub>2</sub> e)	23,426,754	1,772,776		26,470,039
Embodied Carbon/ m <sup>2</sup> of GIA (kgCO <sub>2</sub> e/m <sup>2</sup> )	1176	89		1,329



Table 18 - Plot E - WLC emissions for each lifecycle module – Pre Decarbonisation

Global warming (GWP) grouped by classification breakdown										
Category	A1-A3 Materials	A4 Transport	A5 Construction	B1-B5 Maintenance and Refurbishment	B6 Energy	B7 Water	C1-C4 End of Life	Total kg CO2e	Biogenic carbon storage kg CO2e bio	D External Impacts
Foundation, sub-surface, basement and retaining walls	630,201	6,549	0	0	0	0	6,047	642,798	0	-59,400
External walls and facade	232,030	3,509	0	456	0	0	5,405	241,400	1	-61,000
Columns and load-bearing vertical structures	1,819,702	70,818	0	0	0	0	29,708	1,920,228	0	-321,000
Internal walls and non-bearing structures	631,320	961	0	0	0	0	7,375	639,656	10,700	-1,080
Floor slabs, ceilings, roofing decks, beams and roof	1,161,788	41,103	0	143,088	0	0	30,298	1,376,277	0	-213,000
Other structures and materials	239,178	180	0	29,122	0	0	8,037	276,517	45	-111,000
Windows and doors	520,807	504	0	74,142	0	0	2,556	598,009	71,500	-5,100
Finishes and coverings	299,252	415	0	395,812	0	0	75,567	771,047	0	-39,300
Materials and constructions for external areas	948,936	1,947	0	0	0	0	3,764	954,647	0	-20,200
Building systems and installations	3,641,964	-	0	421,551	0	0	26,291	4,096,423	0	-1,240,000
Construction site scenarios	0	0	276,255	0	0	0	0	276,255	0	0
Electricity use	0	0	0	0	7,901,622	0	0	7,901,622	0	0
Total water consumption	0	0	0	0	0	166,794	0	166,794	0	0
<b>Total kg CO2e</b>	<b>10,125,179</b>	<b>132,602</b>	<b>276,255</b>	<b>1,064,172</b>	<b>7,901,622</b>	<b>166,794</b>	<b>195,048</b>	<b>19,861,672</b>	<b>82,246</b>	<b>-2,071,080</b>

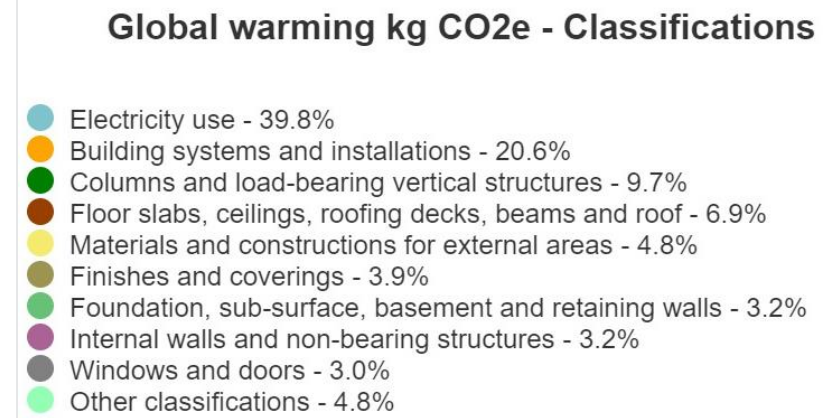
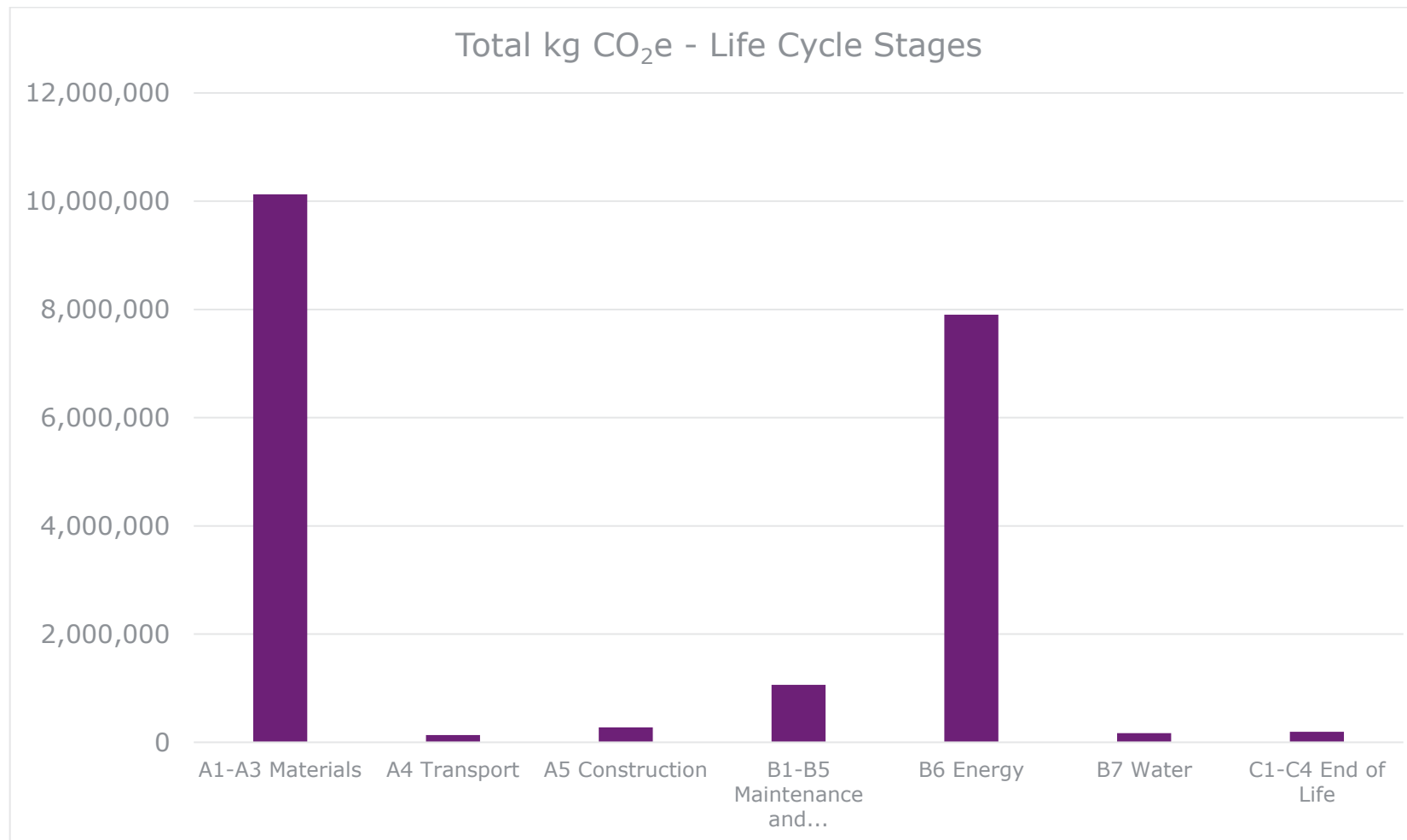


Figure 5- WLC per lifecycle stage (left), WLC per RICS category (right) – Plot E: Pre Decarbonisation

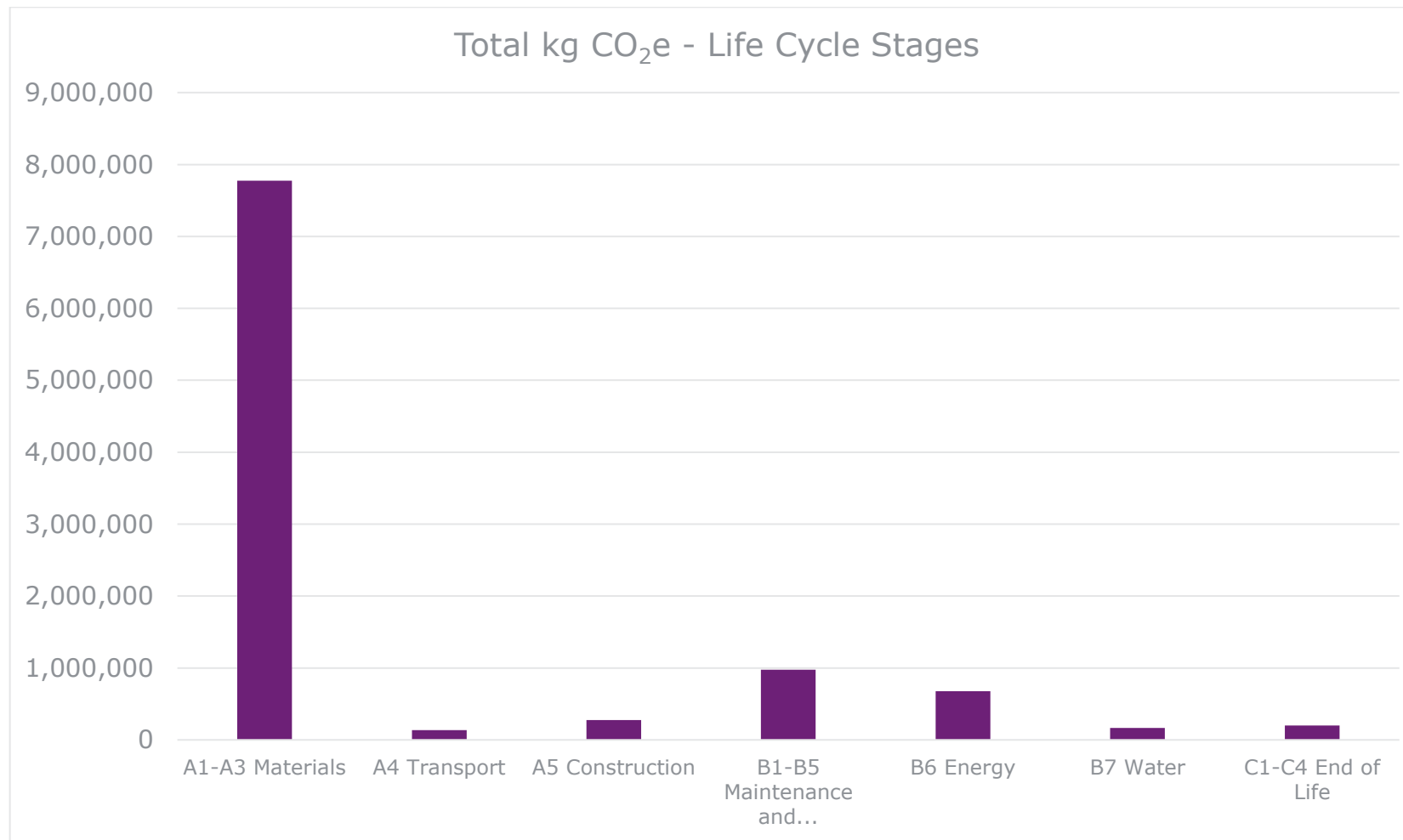
Table 19 - Project's performance against GLA's WLC benchmarks – Plot E: Pre Decarbonisation

Project's performance against GLA's WLC benchmarks				
Modules	A1-A5	B1-B5	C1-C4	A-C
GLA Embodied Carbon Benchmark	850	350		1,200
GLA Embodied Carbon Aspirational Benchmark	500	300		800
Embodied Carbon (kgCO <sub>2</sub> e)	10,944,322	1,259,221		20,271,959
Embodied Carbon/ m <sup>2</sup> of GIA (kgCO <sub>2</sub> e/m <sup>2</sup> )	1,202	138		2,226



Table 20 - Plot E - WLC emissions for each lifecycle module – Post Decarbonisation

Global warming (GWP) grouped by classification breakdown										
Category	A1-A3 Materials	A4 Transport	A5 Construction	B1-B5 Maintenance and Refurbishment	B6 Energy	B7 Water	C1-C4 End of Life	Total kg CO2e	Biogenic carbon storage kg CO2e bio	D External Impacts
Foundation, sub-surface, basement and retaining walls	566,073	6,549	0	0	0	0	6,047	578,669	0	-56,600
External walls and facade	232,030	3,509	0	456	0	0	5,405	241,400	1	-61,000
Columns and load-bearing vertical structures	814,659	70,818	0	0	0	0	29,708	915,185	0	-297,000
Internal walls and non-bearing structures	99,496	911	0	0	0	0	6,883	107,290	10,700	-1,070
Floor slabs, ceilings, roofing decks, beams and roof	561,985	38,501	0	143,088	0	0	29,207	772,781	0	-188,000
Other structures and materials	239,178	180	0	29,122	0	0	8,037	276,517	45	-111,000
Windows and doors	212,920	450	0	74,142	0	0	2,129	289,641	71,500	-4,980
Finishes and coverings	194,091	456	0	307,271	0	0	75,427	577,245	0	-54,400
Materials and constructions for external areas	1,210,995	6,787	0	0	0	0	10,657	1,228,438	0	-113,000
Building systems and installations	3,641,964	6,616	0	421,551	0	0	26,291	4,096,423	0	-1,240,000
Construction site scenarios	0	0	276,255	0	0	0	0	276,255	0	0
Electricity use	0	0	0	0	676,499	0	0	676,499	0	0
Total water consumption	0	0	0	0	0	166,794	0	166,794	0	0
<b>Total kg CO2e</b>	<b>7,773,391</b>	<b>134,776</b>	<b>276,255</b>	<b>975,630</b>	<b>676,499</b>	<b>166,794</b>	<b>199,791</b>	<b>10,203,136</b>	<b>82,246</b>	<b>-2,127,050</b>



### Global warming kg CO<sub>2</sub>e - Classifications

- Electricity use - 45.3%
- Building systems and installations - 23.5%
- Materials and constructions for external areas - 7.0%
- Columns and load-bearing vertical structures - 5.3%
- Floor slabs, ceilings, roofing decks, beams and roof - 4.4%
- Foundation, sub-surface, basement and retaining walls - 3.3%
- Finishes and coverings - 3.3%
- Windows and doors - 1.7%
- Other structures and materials - 1.6%
- Other classifications - 4.5%

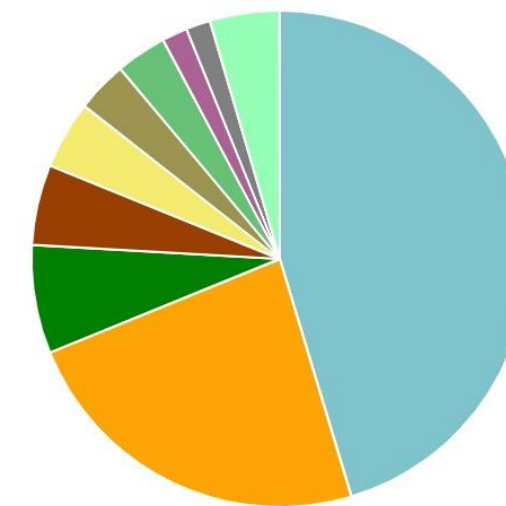


Figure 6- WLC per lifecycle stage (left), WLC per RICS category (right) – Plot E: Post Decarbonisation

Table 21 - Project's performance against GLA's WLC benchmarks – Plot E: Post Decarbonisation

Project's performance against GLA's WLC benchmarks				
Modules	A1-A5	B1-B5	C1-C4	A-C
GLA Embodied Carbon Benchmark	850	350		1,200
GLA Embodied Carbon Aspirational Benchmark	500	300		800
Embodied Carbon (kgCO <sub>2</sub> e)	8,266,668	1,170,679		10,280,640
Embodied Carbon/ m <sup>2</sup> of GIA (kgCO <sub>2</sub> e/m <sup>2</sup> )	908	129		1,129



## 6 Site Activities Emissions

This section provides some additional information and carbon assessment regarding demolition stage site activities and the specialist work carried out till date. This part of the calculation has been separated from the carbon assessment of the building blocks due to two main factors:

- These are ongoing activities and therefore cannot be included in the main calculation since it would result in inaccurate WLC estimation.
- These are site wide activities and are not linked to a particular block.

Based on the recorded information related to the demolition of the existing prison building, the project has had the following emissions till date:

Table 22 - Site activities emissions: Demolition stage

Demolition stage – Site Activities Emissions			
Demolition Activities Category	Amount	Unit	Kg CO <sub>2</sub>
Energy used on site	34916	kWh	8,100
Water used on site	3056.00	m <sup>3</sup>	830
Demolition waste	678	ton	249,000
<b>Total</b>			<b>257,930</b>

Based on the information available regarding specialist groundworks at this stage of the construction the following emissions have been calculated for the project:

Table 23 - Specialist Groundwork Emissions till Date

Specialist Groundworks							
A1-A3	A4	A5	B1-B5	C1-C4	Total kg CO <sub>2</sub> e	Biogenic carbon storage kg CO <sub>2</sub> e bio	D External Impacts
53,000	2,821	0	0	1,500	57,321	0	-16,800

Please note that the above emissions have been excluded from the reported Whole Life Carbon emissions in section 7, since the site activities are ongoing and inclusion of this data in the main WLC assessment would result in inaccurate representation of the emissions associated with these building and construction elements.

## 7 Conclusion

This report has provided the indicative results to the Whole Life Carbon emissions estimated for Project Holloway, completed following the GLA Whole Life-Cycle Carbon Assessment guidance. The presented results account for future decarbonisation of the UK’s electrical grid. The results for the assessment are as summarised below:

Table 24 - Summary table of the Whole Life Carbon Emissions of Phase One of the Proposed Development

Whole Life Carbon Scope	Whole Life Carbon Emissions
Plot C - Pre Decarbonisation	33,329,034
Plot C - Post Decarbonisation	16,455,736
Plot D – Pre Decarbonisation	42,594,312
Plot D - Post Decarbonisation	26,604,798
Plot E – Pre Decarbonisation	19,861,672
Plot E - Post Decarbonisation	10,203,136
<b>Total Demolition Emissions</b>	<b>441,714</b>
<b>Demolition Emissions – Phase I</b>	<b>201,422</b>
<b>Demolition Emissions – Phase II</b>	<b>240,292</b>

The following table provides a summary of project’s Whole Life Carbon Emissions as calculated at the end of stage 2 and the current design stage.

Table 25 - Comparative summary of the Whole Life Carbon Emissions of Phase One of the Proposed Development (including grid decarbonisation).

Whole Life Carbon Scope	Whole Life Carbon Emissions – Stage 3	Whole Life Carbon Emissions – Stage 2
Plot C	16,455,736	25,724,760
Plot D	29,057,980	29,142,806
Plot E	10,203,136	13,286,040





Furthermore, the following table provides a summary of project’s performance against GLA’s WLC benchmarks:

Table 26 - Project's performance against GLA's WLC benchmarks

Modules A1-A5	
GLA WLC Benchmark	<850
GLA WLC Benchmark - Aspirational	<500
Plot C - Pre Decarbonisation	1,098
Plot C - Post Decarbonisation	834
Plot D – Pre Decarbonisation	1,293
Plot D - Post Decarbonisation	1,176
Plot E – Pre Decarbonisation	1,202
Plot E - Post Decarbonisation	908
Modules B1-B5 + C1-C4	
GLA WLC Benchmark	<350
GLA WLC Benchmark - Aspirational	<300
Plot C - Pre Decarbonisation	89
Plot C - Post Decarbonisation	74
Plot D – Pre Decarbonisation	95
Plot D - Post Decarbonisation	89
Plot E – Pre Decarbonisation	138
Plot E - Post Decarbonisation	129
Modules A-C	
GLA WLC Benchmark	<1200
GLA WLC Benchmark - Aspirational	<800
Plot C - Pre Decarbonisation	1,986
Plot C - Post Decarbonisation	984
Plot D – Pre Decarbonisation	2,064

Plot D - Post Decarbonisation	1,329
Plot E – Pre Decarbonisation	2,226
Plot E - Post Decarbonisation	1,129

In comparing the project’s performance against GLA’s Whole Life Carbon benchmarks it is observed that the emissions associated with operational and end of life modules are well within the expected range.

Regarding Modules A1-A5, while the post decarbonisation scenario of all blocks show a significantly lower kgCO<sub>2</sub>e/m<sup>2</sup> GIA compared to the pre-decarbonisation scenario, only Block C is within the expected GLA range.

However in reviewing the Modules A-C performance it is understood that both block C and E are well within the expected GLA range, with Block D having a slightly higher kgCO<sub>2</sub>e/m<sup>2</sup> GIA than GLA’s benchmark.

It is expected that as the project progresses and more actual information is made available to the team and through further implementation of decarbonisation strategies during construction stage, the project would be able to further reduce its WLC emissions in order to meet GLA’s WLC benchmarks.



# APPENDIX A

Record of used EPDs



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
Acrylic bathtub	[france]	DURAVIT : Starck (700345 ; 700344 ; 700342). D-Code (700097 ; 700098 ; 700104 ; 700105) // - KOHLER : Stil 2 (E6812-00 ; E6811-00). Corvette (E60900-00 ; E60901-00/60901-00 ; E60902-00/60902-00 ; E60903-00/60903-00 ; E60904-00/60904-00 ; E60905-00/60905-00). Struktura (E6D020-00/6D020-00 ; E6D021-00/6D021-00). Odeon Up (E6048-00/E6D231-00 ; E6049-00/E6D232-00 ; E6057-00/E6D234-00 ; E6060-00/E6D235-00 ; E6080-00/E6D233-00)		2020	FDES	EN15804+A1	INIES_CBAI20140415_133015, 14205	INIES	Association Française des Industries de la Salle de Bains	EN15804+A1	EN15804+A1	20.8 kg/unit	ecoinvent	verified
Adaptator female/female, RJ45 180°	[europe]	Adaptator RJ45 female/female 180°		2020	PEP	EN15804+A1	HAGE-00441-V01.01-EN, 14086	INIES	Hager SE	PEP-PCR-ed3-FR-2015 04 02	ISO 14025		ecoinvent	verified
Air-to-air heat pump, external unit	[france]	DAIKIN : RXYQ8T - MITSUBISHI ELECTRIC : PUHYP250YKB - YACK &		2019	PEP	EN15804+A1	UNIC-00019-V01.01-FR, 9176	INIES	Uniclimate	PEP-PCR-ed3-FR-2015 04 02	ISO 14025	heating (26.9 kW) and cooling (25.1 kW)	ecoinvent	verified



		MITSUBISHI HEAVY INDUSTRIES : FDC224KXE6												
Aluminium air intake vent	[france]	Grille extérieure de ventilation de type pare-pluie en alminium 200x200		2022	MDEGD_FDES	EN15804 +A1	INIES_DGRI20190821_145950, 31727	INIES	DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFAULT	EN15804+A1	EN15804 +A1	200 x 200 mm, 0.04 m2/unit, 1.295 kg/unit	ecoinvent	verified
Aluminium composite panels for ventilated façade cassettes for window openings	[russia]	FR plus 5x0.5		2020	EPD Aluminium composite panels	EN15804 +A1	S-P-01480	International EPD System	Alcotek LLC	PCR 2012:01 Construction products and construction services, version 2.33.	Only with EN15804	5 mm (panel), 0.5 mm (aluminium layer), 9.95 kg/m2	ecoinvent	verified
Aluminium frame window, double glazed	[belgium]	Masterline 8 Standard		2020	EPD Reynaers Aluminium window Masterline 8 Standard	EN15804 +A1	2000058-001-EN	B-EPD	Reynaers Aluminium	PCR NBN DTD B 08-001	Only with EN15804	32.259 kg/m2, 1.23 x 1.48 m	ecoinvent	verified
Aluminium handrails	[pennsylvania, USA]	HR-6CN/HRO-6, HR-8CN, HR-6CRBN, HR-6CNSS, HR-6CRBNSS, HRO-6RBN, HRO-6CN, HRO-6CRBN		2020	EPD HR/HRO Handrails	ISO 14040	EPD10491	NSF	Construction Specialties (CS)	PCR Part A: Life Cycle Assessment Calculation Rules and Report Requirements, Version 3.2, 2018 Part B: Wall and Door Protection EPD Requirements, Version 1.0, 2019	Only with EN15804 (TRACI 2.1 units only)	5.51 kg/m	GaBi	verified
Aluminium sheet, generic	[LOCAL]		2700.0	2022	One Click LCA	EN15804 +A1, EN15804 +A2	-	One Click LCA	One Click LCA 2022	EN15804+A1	-	50% recycled content, average world aluminium manufacturing technology	ecoinvent	internally
Aluminum gutters	[france]	INOA 280		2020	FDES	EN15804 +A1	INIES_IGOU20200804_125607, 24191	INIES	DALALU	EN15804+A1	EN15804 +A1	0.614 kg/m	ecoinvent	verified
Anhydrite self-leveling screed	[france]	CLASSIC® SA® R+R®, CLASSIC® SP	2161.0	2022	FDES	EN15804 +A1	INIES_IACG20220513_103021, 29954	INIES	ANHYDRITEC	EN15804+A1	EN15804 +A1	45 mm, 95 kg/m2, 2161 kg/m3	ecoinvent	verified
Asphalt roofing	[france]				One Click LCA generic			-					-	



material	country	description	quantity	epd	standard	id	method	manufacturer	notes	unit	verification	
membrane, with Inies data				construction definitions								
Average ceramic sanitary product, washbasins, bidets, toilets, urinals, shower trays, including packaging	[italy]		2019	EPD SANITARY CERAMICS	EN15804+A1	EPDItaly0075	EPD Italy	Ceramica Catalano	PCR IBU Part B: 2017-11-30 v. 1.6 Requirements on the EPD for Sanitary ceramics	Only with EN15804	GaBi verified	
Bitumen roofing membrane	[france]	Asphalte pour étanchéité de toiture [ép totale 20mm]	2021	MDEGD_FDES	EN15804+A1	INIES_DASP20170317_174013, 28031	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFAUT	EN15804+A1	EN15804+A1	20 mm ecoinvent verified	
Brass fixtures, shower heads	[denmark]	080st chromed brass	2018	EPD VOLA A/S	EN15804+A1	MD-18008-EN	EPD Danmark	VOLA	EN15804+A1	-	1.96 kg/piece GaBi verified	
Brass tap	[france]	Robinet d'arrêt/de coupure en laiton	2022	MDEGD_FDES	EN15804+A1	INIES_DROB20200319_144702, 31922	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFAUT	EN15804+A1	EN15804+A1	0.3kg ecoinvent verified	
CCTV system for office buildings per m2	[world]			One Click LCA			One Click LCA				-	
Carpet in rolls	[france]	Forbo Flooring Systems : Tenor, Granit, Showtime, Akzent, Markant, TotemTecom : Tapisom 600, Tapisom 600D Fabricants concernés : FORBO FLOORING SYSTEMS	2018	FDES	EN15804+A1	INIES_CREV20190114_091734, 30955	INIES	KALEI	EN15804+A1	EN15804+A1	width: 2.00 m, 0.978 kg/m2 ecoinvent verified	
Cement based self-	[norway]	Proplan Base NT	1825.0	2022	EPD Proplan Base NT Heydi AS	EN15804+A1	NEPD-3711-2654-NO	EPD Norge	Heydi AS	NPCR 009:2018 Part B for Technical	Only with EN15804	15-80 mm, ecoinvent internationally



leveling screed, fiber reinforced, moisture resistant										- Chemical products in the building and construction industry		C25, 1825 kg/m3			
Ceramic floor tile	[unitedKingdom]		2000.0	2013	EPD Vloertegelcollectie Koninklijke Mosa	EN15804 +A1	11.1.0001.004	MRPI	Mosa	EN15804+A1	-	10 average density kg/m3	mm, 2000	ecoinvent	verified
Ceramic toilet	[france]	- DURAVIT : Starck 3 (420009; 452709; 220209). ME by Starck (452909; 453009). DuraStyle (455209; 457109). // - KOHLER : Struktura (EDE101-00 ; EDF101-00). Patio (EDV101-00 ; E1534-00). Brive (E4345-00) // - ROCA : DEBBA (A346998000 ; A34699L000). VICTORIA (A34630300S).		2020	FDES	EN15804 +A1	INIES_CCUV20200303_175319, 14206	INIES	Association Française des Industries de la Salle de Bains	EN15804+A1	EN15804 +A1	19.6 kg/unit		ecoinvent	verified
Circulating pump	[germany]			2020	ÖKOBAUDAT 2021-II (25.06.2021)	EN15804 +A1	-	OKOBAUDAT		EN15804+A1	-	250-1000W/unit		GaBi	verified
Concrete pavers blocks	[OCLEPD, germany]	Corio®	181.0	2023	EPD CORIO® METTEN Stein+Design	EN15804 +A1, EN15804 +A2	EPDHUB-0365	EPD Hub	METTEN Stein+Design	EPD Hub Core PCR version 1.0, 1 Feb 2022 EN 16757 Product Category Rules for concrete and concrete elements	Only with EN15804	80 mm, 181 kg/m3		ecoinvent	verified
Corrugated plastic pipes	[germany]	FFKuS-EM-F-105 co2ntrol		2020	EPD FFKuS-EM-F-105 co2ntrol® FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG	EN15804 +A1	EPD-FRW-20190167-IBA1-DE	IBU	Fränkische Rohrwerke Gebr. Kirchner GmbH & Co.	PCR Kabelträger, Kabelkanäle – und Elektroinstallationsrohre für elektrische Installation, 07/2018	Only with EN15804	0.138 kg/m		GaBi	verified



Curtain wall with steel frame	[france]			2019	FDES	EN15804 +A1	INIES_CFAÇ20191210_140842, 12996	INIES	UNION DES METALLIERS	EN15804+A1	EN15804 +A1	54.64kg/m <sup>2</sup> , U <sub>w</sub> <2.8W/m <sup>2</sup> . K	ecoinvent	verified
Door and window hinges, European average	[europe]			2016	EPD ARGE; European Federation of Associations of Lock and Builders Hardware Manufacturers Hinges	EN15804 +A1	EPD-ARG-20160193-IBG2-EN	IBU	ARGE	PCR Building Hardware products, 07/2014	Only with EN15804		ecoinvent	verified
Door holders from stainless steel	[indiana, USA]	Glynn-Johnson Overhead Door Stop Holder-100 Series		2019	EPD GLYNN-JOHNSON OVERHEAD DOOR HOLDER 100 SERIES	EN15804 +A1	4787103471.120.1	UL Environment	Schlage Lock Co - Allegion	UL PCR 9004 Builders Hardware, April 2014	Only with EN15804	1.3 kg/unit	GaBi	verified
Double hollow clay bricks internal wall assembly, incl. EPS insulation, for Spain	[spain]				One Click LCA generic construction definitions and deliverable of the Spread of Innovative Solution for SUSTainable CONstruction (IS-SusCon) project			One Click LCA					Other	
Drinking water supply piping network, per m <sup>2</sup> GIFA (office buildings)	[LOCAL]			2019	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-		ecoinvent	internally
Drinking water supply piping network, per m <sup>2</sup> GIFA (residential buildings)	[LOCAL]			2019	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-		ecoinvent	internally
EPS insulation	[italy]	ECO ESPANSO K100	17.5	2018	Environmental Product Declaration: ECO ESPANSO K100	EN15804 +A1	EPDITALY0029	EPD Italy	Isolconfort	PCR ICMQ-001/15 Construction product and Construction service, rev.2	Only with EN15804	L = 0.035 W/mK, R = 2.85 m <sup>2</sup> K/W, 100 mm, 17.5 kg/m <sup>3</sup> ,	GaBi	verified



												Lambda=0.035 W/(m.K)		
Electric elevator elements dependent of the number of floors	[france]	Eléments d'ascenseur électrique dépendants du nombre d'étages (câbles, guides et portes palières) [charge max. = 1000kg]		2022	MDEGD_FDES	EN15804+A1	INIES_DELÉ20180427_112853, 28656	INIES	DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFALT	EN15804+A1	EN15804+A1	305.1 kg/unit, max load: 1000 kg	ecoinvent	verified
Electrical wall outlet	[france]			2016	PEP	PEP	SCHN-00038-V01.01-EN, 5287	INIES	Schneider Electric	EN15804+A1	-	10A 1G 2P UNI + 3 FLAT P CN	ecoinvent	verified
Electricity distribution system, cabling and central, for all building types	[LOCAL]			2019	One Click LCA	EN15804+A1	-	One Click LCA		EN15804+A1	-	per m2 GFA	ecoinvent	internationally
Electricity, United Kingdom	[unitedKingdom]			2015	SAP 10.0 / One Click LCA			One Click LCA				SAP 10.0	ecoinvent	internationally
Emulsion for exterior masonry	[unitedKingdom]	Dulux Trade Weathershield Smooth Masonry Paint Pure Brilliant White, Dulux Trade Weathershield Smooth Masonry Paint Light Base, Dulux Trade Weathershield Smooth Masonry Paint Medium Base, Dulux Trade Weathershield Smooth Masonry Paint Extra Deep Base, Dulux Trade Weathershield Smooth Masonry Paint		2017	EPD Dulux Trade Weathershield Smooth Masonry	EN15804+A1	1.1.00010.2017	MRPI	AkzoNobel	EN15804+A1	-	0.269 kg/m2, 10 m2/l, 1.346 kg/l	ecoinvent	verified





		Magnolia, Dulux Trade Weathershield Smooth Masonry Paint Black, Dulux Trade Weathershield Smooth Masonry Paint Gardenia, Dulux Trade Weathershield Smooth Masonry Paint Sandstone, Dulux Trade Weathershield Smooth Masonry Paint County cream, Dulux Trade Weathershield Smooth Masonry Paint Buttermilk												
Emulsion paint for allround interior use	[unitedKingdom]	Vinyl White Matt		2017	EPD Dulux Trade Vinyl Matt	EN15804+A1	1.1.00001.2017	MRPI	Dulux Trade	EN15804+A1	-	Pigment: Lightfast Pigments, binder: Acrylic Copolymer Dispersion, solvent: Water, 1.444 kg/l, 17 m2/l, 0.17 kg/m2	ecoinvent	verified
Expanded polystyrene insulation (EPS)	[italy]	ECO-DUR ZETA	23.5	2022	EPD ECO-DUR ZETA Stabilimenti di Cologna Veneta e Pozzolo Formigaro (AL)	EN15804+A1	EPDITALY0114 rev.2	EPD Italy	Isolconfort (2022)	PCR Part B Construction products and Construction services – Thermal insulation products (EPDItaly005 – Rev. 0 del 01.07.2020) Lo standard CEN EN15804 è utilizzato come cardine della PCR (PCR ICMQ-001/15 – rev. 2.1).	Only with EN15804	L=0.033 W/mK, R = 3 m2K/W, 100 mm, 2.35 kg/m2, 23.5 kg/m3, Lambda=0.033 W/(m.K)	GaBi	verified
Expansion tank/vessel	[france]	Vase d'expansion		2022	MDEGD_FDES	EN15804+A1	INIES_DVAS20200424_132654, 32137	INIES	DONNEE ENVIRONNEME	EN15804+A1	EN15804+A1	V=25L	ecoinvent	verified



									NTALE GENERIQUE PAR DEFAULT					
Exterior façade mineral plastering mortar coating, French average	[france]	Revêtement extérieur des façades en mortier d'enduit minéral		202 2	MDEGD_FDES	EN15804 +A1	INIES_DREV20170317_ 174052, 31951	INIES	DONNEE ENVIRONNEME NTALE GENERIQUE PAR DEFAULT	EN15804+A1	EN15804 +A1		ecoinve nt	verified
Fire sprinkler	[france]	Sprinkler pendant		202 2	MDEGD_FDES	EN15804 +A1	INIES_DSPR20201130_ 194806, 31681	INIES	DONNEE ENVIRONNEME NTALE GENERIQUE PAR DEFAULT	EN15804+A1	EN15804 +A1	0.072 kg/unit	ecoinve nt	verified
Flexible tile adhesivefor ceramic coverings	[germany]	Flexmörtel® S1 Rapid, Flexmörtel® S2 Rapid	1300.0	201 6	Oekobau.dat 2017-I, EPD Verformungsfähig er Fliesenkleber PCI Flexmörtel® S1 Rapid Hochverformungs fähiger Fliesenkleber PCI Flexmörtel® S2 Rapid	EN15804 +A1	EPD-PCI-20160117- IBE1-DE	IBU	PCI Augsburg GmbH	PCR Mineralische Werkmörtel, 07/2014	Only with EN15804	2.2 kg/m2, 2.4 kg/m2, 1200 kg/m3, 1400 kg/m3	GaBi	verified
Geogrid from polypropylen e (PP) and geotextile	[unitedKing dom]	TriAx TX 150- GD		201 7	EPD Geogrid TriAx TX 150-GD Tensar International Limited, Oekobau.dat 2017-I	EN15804 +A1	EPD-Tensar-012-EN	Kiwa BCS	Tensar International	PCR Anforderungen an Umweltproduktdekl aration für Geokunststoffe/- textilien (Ausgabe 2017-06)	Only with EN15804	367 g/m2, 4x50 m rolls	GaBi	verified
Glass wool insulation panels, unfaced, generic	[LOCAL]		25.0	201 8	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-	L = 0.031 W/mK, R = 3.23 m2K/W (18 ft2°Fh/BTU), 25 kg/m3 (1.56 lbs/ft3), (applicable for densities: 0-25 kg/m3 (0-1.56 lbs/ft3)), Lambda=0.031 W/(m.K)	ecoinve nt	internalo nly
Granular surfacing ø	[LOCAL]		1700.0	201 6	LCA of crushed	ISO14040	-	One Click LCA		-	Only with EN15804		ecoinve nt	internalo nly



8...20 mm, 35 kg/m <sup>2</sup>					stone, OneClickLCA 2016									
Gravel for roads and side walks, with hydraulic binder stabilizer	[france]	Voirie et revêtements extérieurs à base de sable stabilisé avec liant hydraulique [ép. 10 cm] [A4= 0 km] - DONNEE ENVIRONNEMENTALE PAR DEFAUT	2100.0	2022	MDEGD_FDES	EN15804 +A1	INIES_DVOI20200624_104026, 32140	INIES	MINISTERE DE L'ENVIRONNEMENT, DE L'ENERGIE ET DE LA MER - MINISTERE DU LOGEMENT ET DE L'HABITAT DURABLE	EN15804+A1	EN15804 +A1	300 mm, 618 kg/m <sup>2</sup> , 2100 kg/m <sup>3</sup>	ecoinvent	verified
Gypsum plaster	[germany]		1100.0	2014	Oekobau.dat 2017-I, EPD GIPSPUTZ Bundesverband der Gipsindustrie e.V.	EN15804 +A1	EPD-BVG-20140073-IAG1-DE	IBU	Bundesverband der Gipsindustrie	PCR Mineralische Werkmörtel, 10/2012	Only with EN15804	1100 kg/m <sup>3</sup>	GaBi	verified
Gypsum plaster board, regular, 10% recycled gypsum	[LOCAL]		858.0280607132333	2022	One Click LCA	EN15804 +A1, EN15804 +A2	-	One Click LCA		EN15804+A1	-	6.5-25 mm (0.25-0.98 in), 10.725 kg/m <sup>2</sup> (2.20 lbs/ft <sup>2</sup> ) (for 12.5 mm/0.49 in), 858 kg/m <sup>3</sup> (53.6 lbs/ft <sup>3</sup> )	ecoinvent	internally
Gypsum plaster board, regular, generic	[LOCAL]		858.0280607132333	2018	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-	6.5-25 mm (0.25-0.98 in), 10.725 kg/m <sup>2</sup> (2.20 lbs/ft <sup>2</sup> ) (for 12.5 mm/0.49 in), 858 kg/m <sup>3</sup> (53.6 lbs/ft <sup>3</sup> )	ecoinvent	internally
Gypsum plasterboard	[unitedKingdom]		718.8	2018	EPD GTEC Plasterboard	EN15804 +A1	BREG EN EPD 000204	BRE	Etex Building Performance	EN15804+A1	-	12.5 mm, 8.985 kg/m <sup>2</sup> (average product weight)	ecoinvent	verified
Gypsum plasterboard for suspended ceiling systems	[netherlands]		720.0	2020	NIBE2899	EN15804 +A1	NIBE283	INSIDE/INSIDE		EN15804+A1	-	12.5 mm, 9 kg/m <sup>2</sup> , 720 kg/m <sup>3</sup>	ecoinvent	verified



HS2 baseline - Cement grout	[unitedKing dom, netherlands]		1250.0	2016	EPD Modified mineral mortars, group 3 FEICA - Association of the European Adhesive and Sealant Industry	EN15804 +A1	EPD-FEI-20160043-IBG1-EN	-	-	PCR Mineral factory-made mortar, 07.2014	Only with EN15804	Cementitious modified mineral mortar	GaBi	noverification
Heat distribution piping network, per m2 heated area, all building types	[LOCAL]			2019	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-		ecoinvent	internally
Hollow clay bricks	[spain]		677.0	2019	DAP Ladrillos y bloques cerámicos para revestir	EN15804 +A1	EPD 008-007	AENOR	Ceranor	RCP-002-AENOR GlobalEPD Ceramic coatings	Only with EN15804	677 kg/m3	GaBi	verified
Insulated system wall with brick slips and medium dense block, U-value 0.22	[unitedKing dom]				Part L 2016			One Click LCA				(Part L 2016)	Other	
Internal partition wall, biogenic CO2 not subtracted (for CML)	[france]	La référence commerciale couverte par cette FDES est : Cloison de distribution : PREGYFAYLITE Le système PREGYFAYLITE est composé d'un panneau PREGYFAYLITE. Les références commerciales des panneaux PREGYFAYLITE couvertes par cette FDES sont : PREGYFAYLITE BA50 PREGYFAYLITE DECO BA50 PREGYFAYLITE HYDRO BA50 PREGYFAYLITE		2022	FDES	EN15804 +A1	INIES_ITOL20220816_1 23221, 30716	INIES	ETEX France Building Performance : SINIAT - SALSI	EN15804+A1	EN15804 +A1	16.9 kg/m2	ecoinvent	verified



		HYDRO DECO BA50												
Internal wall system with rock wool core, chipboard siding and steel frame	[netherlands]			2020	EPD 21002-NIBE2044 - Staalframe; tweezijdig staal beplating	EN15804 +A1	NIBE2044	INSIDE/INSIDE		EN15804+A1	-	71mm, 19.4 kg/m2	ecoinvent	verified
Kitchen cabinet door, melamine faced chipboard	[sweden]	Harmoni White		2020	EPD Painted Plain MFC Kitchen Door	EN15804 +A1	S-P-02127	International EPD System	Ballingslöv	PCR Furniture, Except seats and mattresses 2012:19 version 2.01 valid until 2023-06-17	Only with EN15804	5.5 kg/unit	ecoinvent	verified
LAN cable	[france]	032878		2022	PEP	EN15804 +A1	LGRP-01411-V01.01-FR, 32226	INIES	LEGRAND	PEP-PCR-ed3-FR-2015 04 02	ISO 14025	0.16 kg/m, CAT6A F/UTP	ecoinvent	verified
LED lighting	[france]	Réglette LED		2022	MDEGD_FDES	EN15804 +A1	INIES_DRÉG20191220_143840, 31766	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFALT	EN15804+A1	EN15804 +A1	P = 40W	ecoinvent	verified
Laminated skirting board, biogenic CO2 not subtracted (for CML)	[france]	Plinthe parquet stratifié [haut. 7cm et ép. 1cm] [Gestion non durable]		2022	MDEGD_FDES	EN15804 +A1	INIES_DPLI20200120_162845, 28784	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFALT	EN15804+A1	EN15804 +A1	0.53 kg/m, height 70-100 mm, unsustainable management	ecoinvent	verified
Lightweight concrete block, with expanded clay aggregate, generic	[LOCAL]		650.0	2018	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-	650 kg/m3 (40.6 lbs/ft3), 18 kg/block (39.7 lbs/block), 0.5x0.3x0.185 mm (0.019x0.012x0.007 in)	ecoinvent	internally
Lightweight concrete masonry units (CMU) with stone wool insulation	[germany]	Kalopor	600.0	2019	EPD Plan-Blöcke mit integrierter Dämmung - KLB Kalopor	EN15804 +A1	EPD-KLB-20180129-IAA2-DE	IBU	KLB Klimaleichtblock	PCR Leichtbeton, 07/2014	Only with EN15804	0.08 W/mK, 450-600 kg/m3	GaBi	verified



Low voltage cable	[france]	Câble basse tension 0,6/1kV		2022	MDEGD_FDES	EN15804+A1	INIES_DCÂB20191220_142755, 32093	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFAUT	EN15804+A1	EN15804+A1	Section conductrice de 5 mm2 à 120 mm2	ecoinvent	verified
Luxury vinyl floor tiles	[unitedKingdom]	Amtico Form		2018	EPD Amtico Form (Artisan Wood and Contemporary Ceramic Emboss) Luxury Vinyl Floor Tiles	EN15804+A1	BREG EN EPD 000227	BRE	Amtico	EN15804+A1	-	2.5 mm, 3.472 kg/m2	ecoinvent	verified
Masonry mortar/facing wall mortar/mortar with special properties	[germany]		1500.0	2014	Oekobau.dat 2017-I, EPD Mineralische Werkmörtel: Mauermörtel - Vormauermörtel/ Mörtel mit besonderen Eigenschaften Industrieverband WerkMörtel e.V. (IWM)	EN15804+A1	EPD-IWM-20130239-IBG1-DE	IBU	IWM	PCR Mineralische Werkmörtel, 10/2012	Only with EN15804	1500 kg/m3, EPD coverage: >1500 kg/m3	GaBi	verified
Mirror	[france]	Miroid Morena SAFE+	2500.0	2021	FDES	EN15804+A1	INIES_ITJE20211018_114834, 27641	INIES	AGC SAS France	EN15804+A1	EN15804+A1	6 mm, 15 kg/m2, 2500 kg/m3	GaBi	verified
Monitoring equipments	[france]	Equipements de monitoring		2022	MDEGD_FDES	EN15804+A1	INIES_DEQU20190919_091608, 31860	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFAUT	EN15804+A1	EN15804+A1		ecoinvent	verified
Mortar for masonry use	[france]		1500.0	2016	FDES	EN15804+A1	INIES_CMOR20110829_083510, 6064	INIES	SNMI	EN15804+A1	EN15804+A1	1500 kg/m3	ecoinvent	verified
Natural stone quartzite schist, naturally cleft surface, with broken edges	[norway]		2700.0	2015	NEPD-315-192-EN Natural stone quartzite schist, natural cleft surface, with broken or sawn edges, Minera	EN15804+A1	NEPD-315-192-EN	EPD Norge	Minera Skifer	IBU PCR Requirements on the EPD for Dimension stone for roof, wall and floor applications	Only with EN15804	30 - mm, 2700 kg/m3	ecoinvent	verified
PE multilayer pipes for hot and cold water installations	[germany, OCLEPD]	Uni Pipe Plus		2022	EPD UPONOR UNI PIPE PLUS DIAMETER RANGE 16-32 MM	EN15804+A1, EN15804+A2	RTS_164_22	RTS	Uponor Corporation	PCR RTS (Finnish version, 26.8.2020)	Only with EN15804	Diameter: 16-32 mm	ecoinvent	verified



					UPONOR CORPORATION									
Plate heat exchanger	[france]	Echangeur à plaques (préparateur ECS)		2022	MDEGD_FDES	EN15804+A1	INIES_DECH20190710_161707, 31566	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFALT	EN15804+A1	EN15804+A1	P = 150kW	ecoinvent	verified
Power outlet, low current	[france]	Prises de courant faible		2022	MDEGD_FDES	EN15804+A1	INIES_DPRI20190819_150144, 31714	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFALT	EN15804+A1	EN15804+A1		ecoinvent	verified
Precast concrete part, staircase	[germany]			2020	ÖKOBAUDAT 2021-II (25.06.2021)	EN15804+A1	-	OKOBAUDAT		EN15804+A1	-	1,1 m wide, 9 steps each 16 cm, 1965 kg/unit	GaBi	verified
Precast concrete piles, hollow tubes	[france]	Pieu foré à la tarière creuse [diam. 70 cm] en béton armé	2279.0	2022	MDEGD_FDES	EN15804+A1	INIES_DPPIE20190121_110902, 31740	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFALT	EN15804+A1	EN15804+A1	Diam. = 700 mm, avg. dens: 2279 kg/m3	ecoinvent	verified
Precast concrete slab, for balcony, incl. reinforcement	[france]			2019	FDES	EN15804+A1	INIES_CBAL20190802_103839, 18545	INIES	SNBPE	EN15804+A1	EN15804+A1	ep. 0.2m, C25/30 XF1 CEM II/A-L ou LL	ecoinvent	verified
Prepainted steel sheets for roofs and facades	[italy]	SAND 28		2020	EPD SAND 20, SAND 28, SAND A55 P600, SAND 153/870, SAND 105/1100 and SANDfuture 575	EN15804+A1	S-P-02159	International EPD System	Sandrini Metalli Spa	PCR 2012:1 Construction products and construction service, Version 2.32, valid until 31/12/2020	Only with EN15804	0.70 mm, 6.80 kg/m2	ecoinvent	verified
Ready-mix concrete, high strength, generic	[LOCAL]		2400.0	2022	One Click LCA	EN15804+A1, EN15804+A2	-	One Click LCA	One Click LCA 2022	EN15804+A1, EN15804+A2	-	C55/67 (7977/9717 PSI) with CEM II/A-S, 20% GGBS in cement (466 kg/m3; 29.1 lbs/ft3 total cement)	ecoinvent	internally
Ready-mix concrete,	[LOCAL]		2400.0	2018	One Click LCA	EN15804+A1,	-	One Click LCA		EN15804+A1	-	C60/75 (8700/10900)	ecoinvent	internally



high-strength, generic						EN15804 +A2						PSI), 0% recycled binders in cement (500 kg/m3 / 31.21 lbs/ft3)		
Ready-mix concrete, normal-strength, generic	[LOCAL]		2400.0	2018	One Click LCA	EN15804 +A1, EN15804 +A2	-	One Click LCA		EN15804+A1	-	C40/50 (5800/7300 PSI), 0% recycled binders in cement (400 kg/m3 / 24.97 lbs/ft3)	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/m3	ecoinvent	verified
Reinforcement steel (rebar), generic	[LOCAL]		7850.0	2018	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-	0% recycled content (only virgin materials), A615	ecoinvent	internally
Removable/mobile partitions with aluminum frame, glazed	[france]			2018	FDES	EN15804 +A1	INIES_CCLO20181003_101314, 14170	INIES	Organisation professionnelle représentative des concepteurs, fabricants et installateurs de menuiseries extérieures en profilés aluminium	EN15804+A1	EN15804 +A1	38.02 kg/m2	ecoinvent	verified
Rock wool insulation panels, unfaced, generic	[LOCAL]		150.0	2018	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-	L = 0.037 W/mK, R = 2.70 m2K/W (15 ft2°Fh/BTU), 150 kg/m3 (9.36 lbs/ft3) (applicable for densities: 100-150 kg/m3 (6.24-9.36 lbs/ft3)), Lambda=0.037 W/(m.K)	ecoinvent	internally





Router	[china]	Zigbee Router		2020	EPD Router Product Zigbee Network	EN15804 +A1	4789027809.118.1	UL Environment	Assa Abloy	PCR UL Part B: Builders Hardware EPD Requirements, Version 1.0, November 2019	Only with EN15804	0.18 kg/unit	GaBi	verified
Sanitary ceramics, bathtubs and shower trays	[germany]	Durasolid		2018	EPD Bade- und Duschwannen aus Mineralguss (Durasolid A) DURAVIT AG	EN15804 +A1	EPD-DUR-20170167-IBC1-DE	IBU	DURAVIT AG	PCR Sanitärprodukte aus Verbundwerkstoffen	Only with EN15806	0.33kg/m2, 2065 x 1100 x 845 mm, 107 - 115 kg/unit	GaBi	verified
Sewage water drainage piping network, per m2 GIFA (office buildings)	[LOCAL]			2019	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-		ecoinvent	internally
Sewage water drainage piping network, per m2 GIFA (residential buildings)	[LOCAL]			2019	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-		ecoinvent	internally
Stainless steel guard railing	[france]	Garde corps barreaudé en acier inoxydable		2022	MDEGD_FDES	EN15804 +A1	INIES_DDWD20220429_151859, 29747	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFALT	EN15804+A1	EN15804 +A1	15.06 kg/m, Lambda=15.06 W/(m.K)	ecoinvent	verified
Steel faced, fire proof, sandwich panels with stone wool core	[finland]	AST T/AST L		2016	NEPD-404-283-EN Paroc AST T and AST L fire proof panels	EN15804 +A1	NEPD-404-283-EN	EPD Norge	Paroc	NPCR 010 Building boards, rev1	Only with EN15804	25 kg/m2, 200 mm	ecoinvent	verified
Steel mesh ceiling tile system	[unitedKingdom]	SAS 330		2018	EPD SAS 330 Metal Mesh Ceiling Tile	EN15804 +A1	BREG EN EPD000217	BRE	SAS International	EN15804+A1	-	from 1200 x 300mm to 3000 x 600mm, 4.42 kg/m2	ecoinvent	verified
Steel pipes for heating and cooling system	[france]	Tube en acier noir pour usage en chauffage et climatisation		2022	MDEGD_FDES	EN15804 +A1	INIES_DTUB20200414_112555, 31931	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEFALT	EN15804+A1	EN15804 +A1	DN=32mm, 3.17 kg/m	ecoinvent	verified



Steel stud internal wall assembly, 100 mm, incl. mineral wool insulation, Steel stud wall 100 mm, incl. mineral wool insulation 100 mm and plasterboard 13 mm on both sides	[europe]				One Click LCA generic construction definitions			One Click LCA					Other	
Structural steel profiles, generic	[LOCAL]		850.0	2018	One Click LCA	EN15804 +A1, EN15804 +A2	-	One Click LCA		EN15804+A1	-	60% recycled content, I, H, U, L, and T sections, S235, S275 and S355	ecoinvent	internally
Surveillance camera, French average	[france]	Equipements pour la capture d'image (caméras)		2016	MDEGD_FDES	EN15804 +A1	INIES_DEQU20161116_164440, 5662	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEF AUT	EN15804+A1	EN15804 +A1		ecoinvent	verified
Suspended acoustic ceiling panel, metal framed	[france]	Panneau acoustique Stereo		2021	FDES	EN15804 +A1	INIES_ISTE20210802_140601, 33513	INIES	TEXAA	EN15804+A1	EN15804 +A1	5.41 kg/m2	ecoinvent	verified
Synthetic membrane for waterproofing of underground walls and foundations	[france]	Membrane synthétique pour l'étanchéité et l'imperméabilisation pour murs enterrés [ép. 2mm]		2022	MDEGD_FDES	EN15804 +A1	INIES_DMEM20161116_164605, 31380	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEF AUT	EN15804+A1	EN15804 +A1	1.96 kg/m2	ecoinvent	verified
Terracotta clay tiles, interlocking	[france]			2020	FDES	EN15804 +A1	INIES_CTUI20200319_142141, 29820	INIES	CENTRE TECHNIQUE DE MATERIAUX NATURELS DE CONSTRUCTION	EN15804+A1	EN15804 +A1	45.4 kg/m2	ecoinvent	verified
Thermostat, automatic, French average	[france]	Thermostats, automatique		2016	MDEGD_FDES	EN15804 +A1	INIES_DTHE20170317_174335, 6408	INIES	DONNEE ENVIRONNEMENTALE GENERALE PAR DEF AUT	EN15804+A1	EN15804 +A1	63A	ecoinvent	verified
Ventilation ducting	[LOCAL]			2019	One Click LCA	EN15804 +A1	-	One Click LCA		EN15804+A1	-	per m linear, D: 80 mm (3.15 in)	ecoinvent	internally



Ventilation system for residential building	[LOCAL, paraguay]			2019	One Click LCA	EN15804+A1	-	One Click LCA		EN15804+A1	-	per m2 GFA	ecoinvent	internally
Ventilator for decentralized ventilation with heat recovery (wall, ceiling mounted)	[germany]			2020	ÖKOBAUDAT 2021-II (25.06.2021)	EN15804+A1	-	OKOBAUDAT		EN15804+A1	-	60 m3/h, 3.7 kg/unit	GaBi	verified
Water-borne interior paints	[finland, OCLEPD]	Biora, Ekora, Kolibri Sand, Paneelikattomali, Ranch, Superlateksi, Tapettipohjamaali, Teknospro, Tela, Timantti, Trend	1360.0	2018	EPD RTS EPD, Water-borne interior paints	EN15804+A1	RTS_14_18	RTS	Teknos	RTS PCR protocol: EPDs published by the Building Information Foundation RTS sr (2016)	Only with EN15804	1.36 kg/L, average coverage 8-10 m2/L	ecoinvent	verified
Waterproofing membrane, single component, cold applied, from PU	[unitedKingdom]	Sikalastic-618	1380.0	2016	BREGENEPD000112	EN15804+A1	BREG EN EPD000112	BRE	Sika	EN15804+A1	-	1.3 mm, 1.79 kg/m2	GaBi	verified
Waterproofing membrane, single component, cold applied, from PU	[unitedKingdom]	Sikalastic-625	1320.0	2016	BREGENEPD000111	EN15804+A1	BREG EN EPD0000111	BRE	Sika	EN15804+A1	-	1.5 mm, 1.98 kg/m2	GaBi	verified
Wooden door with wooden frame, biogenic CO2 not subtracted (for CML)	[france]			2019	FDES	EN15804+A1	INIES_CBLO20190718_140351, 27438	INIES	Union des Industriels et Constructeurs Bois	EN15804+A1	EN15804+A1	1.03 X 2.09 m, 22.24 kg/m2	ecoinvent	verified
Woven vinyl carpet, tile flooring	[georgiaUS, USA]	Chilewich BioFelt Flooring		2017	EPD Flooring BioFelt	EN15804+A1	4787689156.101.1	UL Environment	Chilewich Sultan LLC	IBU PCR for Floor Coverings (UL E, V1.0 Aug. 27, 2014)	Only with EN15804	4.95 mm, 3.006 kg/m2, 607 kg/m3	ecoinvent	verified