

Whole Life Carbon Comparison Study

Radlett House



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Document information

Document prepared for

Rundell Associates

Date of issue

03/05/2024

Issue no.

2

Our reference

10605- Radlett house -WLC-RICS-S2 -2404-18 HA

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Whole Life Carbon Comparison Study

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Executive summary

Introduction

Eight Versa has conducted a comprehensive Whole Life Carbon Assessment (WLC) for Radlett House, evaluating two distinct scenarios. The initial planning applications, endorsed by the Camden Council in March 2012 (Application Ref: 2011/5102/P) and November 2022 (Application ref: 2022/2773/P), proposed extensions to the house. This report presents a comparative analysis between the Approved Extension and New Construction proposal for Radlett House.

The results presented in this report are in line with ISO 14040:2006, ISO 14044:2006, and EN 15978:2011 standards. The methodology followed is also aligned with the RICS's Whole Life Carbon Assessment for the Built Environment Professional Statement, 1st edition.

The purpose of this report is to provide insight into the development's environmental profile by measuring the carbon emissions over its entire life span. A comparative whole life carbon assessment has been carried out for an Approved Extension and a New construction scenario for the development considering both the embodied and the operational carbon emissions. The analysis also highlights carbon hot spots, which could potentially be a focus for carbon emission reduction measures.

The site is located within the London Borough of Camden and specifically within the Primrose Hill ward. The property is in the north-western corner of Radlett Place, on the south-western edge of Primrose Hill. Radlett Place is a gated, privately owned cul-de-sac leading from the busy thoroughfare of Avenue Road. The site is bound by residential properties to the north (fronting Elsworth Road), south (fronting Avenue Road) and east (fronting Radlett Place).

The site currently comprises of a two-storey dwelling house, plus habitable roof level accommodation. The initial planning application Ref: 2011/5102/P proposed excavation of a basement beneath the main house with front and rear lightwells and a two-storey basement link under the garden between the house and the previously approved swimming pool outbuilding, and installation of air conditioning unit and enclosure in garden, all in association with the use of the single-family dwelling (Class C3).

The second application (Ref: 2022/2773/P) comprised of creation of a crown tiled roof / attic floor above two storey rear projection of dwelling (Use Class C3) including no.5 dormer windows and linked walkway to existing loft.

The GIA for the extensions proposed in the above application is 1,530 m². The total area of the scheme with Approved Extension and retention of existing structure is 2,393 m².

The New Construction proposal comprises of demolition of the existing two-storey dwelling house, plus habitable roof level accommodation and replace it with a high performing house. The total GIA of the proposed New Construction scheme is 1,935 m².

The WLC assessment includes a comparison between the following two scenarios:

- Approved Extension scenario: The main house is retained as it is, no improvement in internal finishes or energy performance are made. And the scope from the two planning applications Ref no: 2011/5102/P and Ref no: 2022/2773/P has been added, which mainly comprises of excavation of a basement beneath the main house and a two-storey basement link under the garden between the house and the previously approved swimming pool outbuilding and creation of a crown tiled roof / attic floor above two storey rear projection of dwelling and linked walkway to existing loft.
- New Construction scenario: all existing building materials on site will be demolished and newly constructed.

Summary of results

The carbon emissions of the Approved Extension and New Construction scenario are approximately:

Carbon emissions	Approved Extension scenario	New Construction scenario	% diff. for New Construction
Demolition emissions from existing house (C)	0 kgCO _{2e} /m ²	29 kgCO _{2e} /m ²	
Upfront embodied carbon (A1-A5)	555 kgCO _{2e} /m ²	544 kgCO _{2e} /m ²	2% ↓
Whole life embodied carbon (A-C, exc. B6 -B7)	742 kgCO _{2e} /m ²	729 kgCO _{2e} /m ²	2% ↓
Total whole life carbon (A-C)	1,080 kgCO _{2e} /m ²	823 kgCO _{2e} /m ²	31% ↓

At the time of practical completion (year 0), the New Construction scenario exhibits a modest (2%) reduction in embodied carbon compared to the Approved Extension scenario. This difference arises primarily from the carbon emissions from demolition of the existing building offset by the increased carbon embodied in the larger, double-storey basement of the Approved Extension scenario. Moreover, it's important to note that the Approved Extension scenario presents substantially higher operational impacts than the New Construction scenario. This difference ultimately results in a significant 31% reduction in total whole life carbon emissions over the entire 60-year life cycle when opting for the new construction over the approved extension scenarios.

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Methodology

Life Cycle Assessment

The WLC assessment has been undertaken using 'One-Click LCA' building life cycle assessment software with the following principal data sources:

- Design and quantity information provided by the design team available at RIBA Stage 2.
- Energy consumption data provided by Eight Versa.
- LCA data source(s): One-Click LCA (GLA/RICS)

The results presented are global warming potential. [GWP, kg CO₂e]

Life Cycle Assessment (LCA) is a method for assessing potential environmental, resource and other impacts of a system including products, buildings, events and services. A LCA can provide cradle-to-grave results of the system including upstream and downstream factors. A graphical illustration of typical LCA stages is shown in Figure 1.

Buildings are a significant source of carbon emissions globally. These emissions occur due to construction products and activities as well as consumption of energy and water during use.

The environmental impact of a building can be reduced by designing for lower energy consumption and by consuming less construction products by opting for refurbishment over new-build and by integrating material efficiency design approaches. In addition, products that have a lower environmental impact should be selected.

Existing buildings are responsible for a major share of energy use and greenhouse gas emissions. Refurbishment of existing buildings may improve operational energy performance but will likely cause environmental impacts due to the newly installed construction products and components added to improve energy performance. However, new buildings, while potentially more energy efficient, typically use more construction products and therefore often have higher upfront construction carbon emissions compared with refurbishment.

To address these trade-offs and establish which approach will have the least environmental impact, it is essential to take a life cycle approach. Conducting an LCA will provide insight into the development's environmental profile including appraisal of options under consideration by the project team.



Figure 1: Stages included within an LCA.

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Study Boundary

To undertake a WLC assessment of a building, different aspects need to be considered at different life stages. What is and is not included is referred to as the scope of the assessment and different methodologies call for different scopes. This assessment is based on the assessment of

- All construction elements present in documents from previous planning applications and proposed New Construction.

The following life stages are included in the scope of this assessment:

- A1-A3: Product stage - raw materials supply, transport and manufacturing
- A4: Transport of the products to the construction site **[More information on Page 7]**
- A5: Construction of the building
- B1-B5: In use emissions (repair, replacement, and maintenance)
- B6a and B6b: Operational energy use
- B7: Operational water use
- C1-C4: Deconstruction/demolition, waste processing and disposal
- D: Reuse, recovery and recycling potential

The scope for the assessment for both scenarios is consistent and includes the following:

RICS Cat. and Building elements	Inclusion Status (Extension)	Inclusion Status (New build)
0.0 - Demolition	Not applicable	✓
0.0 - Excavation	✓	✓
1.0 - Sub structure	✓	✓
2.1 - Frame	✓	✓
2.2 - Upper Floors	✓	✓
2.3 - Roofs	✓	✓
2.4 - Stairs and Ramps	✓	✓
2.5 - External Walls	✓	✓
2.6 - Windows & Doors	✓	✓
2.7 - Internal Walls	✓	✓
2.8 - Internal Doors	✓	✓
3.0 - Finishes (Wall, floors, and ceiling)	✓	✓
4.0 - Furniture, fixtures, and	Data not available	Data not available
5.0 - Building Services (MEP)	✓	✓
8.0 - External works	Data not available	Data not available

In both cases, fittings, furniture, and fitouts (FFE) and external works have been excluded from the assessment due to unavailability of the information.

Study Period

The study period for this project is 60 years.

Assumptions and Standards

The following data has been used for this assessment:

- Supporting plans, elevations, sections and build ups for planning applications, endorsed by the Camden Council in March 2012 (Application Ref: 2011/5102/P) and November 2022 (Application ref: 2022/2773/P).
- Where no or insufficient information was provided, Eight Versa have endeavoured to use reasonable assumptions.
- CIBSE Guide G (Good practice) water consumption data for domestic/residential.
- Average transport values for the UK, according to One-Click LCA (GLA/RICS) database
- Estimated operational energy consumption data provided by Eight Versa based on SAP calculations.

The software used to undertake the analysis is One-Click LCA, which complies with:

- ISO 14040 2006: Environmental management - Life cycle assessment - Principles and framework
- ISO 14044 2006: Environmental management - Life cycle assessment - Requirements and guidelines
- EN 15978 2011: Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method

A detailed schedule of items included in the assessment is presented in the Appendix.

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The scheme

Description of Approved Extension scenario

The site is located within the London Borough of Camden and specifically within the Primrose Hill ward. The property is in the north-western corner of Radlett Place, on the south-western edge of Primrose Hill. Radlett Place is a gated, privately owned cul-de-sac leading from the busy thoroughfare of Avenue Road. The site is bound by residential properties to the north (fronting Elsworth Road), south (fronting Avenue Road) and east (fronting Radlett Place).

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The second application (Ref: 2022/2773/P) comprised of creation of a crown tiled roof / attic floor above two storey rear projection of dwelling (Use Class C3) including no.5 dormer windows and linked walkway to existing loft.

The GIA for the extensions proposed in the above application is 1,530 m². The total area of the scheme with Approved Extension and retention of existing structure is 2,393 m².

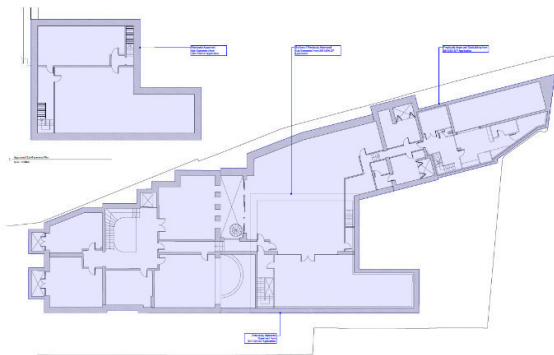


Figure 2: Plan view of basement for the Approved Extension scenario.

Description of the proposed New Construction scenario

The New Construction proposal comprises of demolition of the existing two-storey dwelling house, plus habitable roof level accommodation and replace it with a high performing house. The total GIA of the proposed New Construction is approximately 1,935 m².

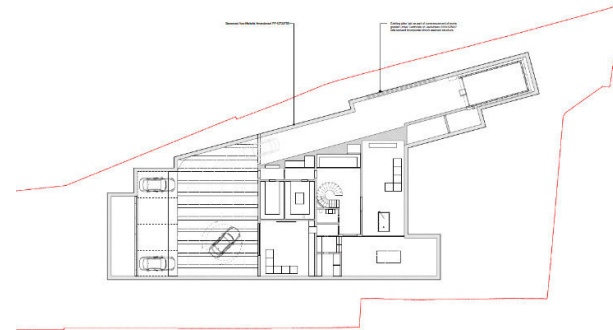


Figure 3: Plan view of the proposed New Construction scenario with red dashed boundary showing the initial Approved Extension proposal

The WLC assessment includes a comparison between the following two scenarios:

- The Approved Extension scenario: The main house is retained as it is, no improvement in internal finishes or energy performance are made. And the scope from the two planning applications Ref no: 2011/5102/P and Ref no: 2022/2773/P has been added, which mainly comprises of excavation of a basement beneath the main house and a two-storey basement link under the garden between the house and the previously approved swimming pool outbuilding and creation of a crown tiled roof / attic floor above two storey rear projection of dwelling and linked walkway to existing loft.
- The New Construction scenario: all existing building materials on site will be demolished and newly constructed.

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Energy consumption inputs

The regulated energy consumption inputs are based on SAP energy assessments carried out by Eight Versa for the development. The assessments have been carried out comparing the Existing, the Approved Extension and New Construction scenarios. The floor areas align with the energy assessment and do not include the unheated basement space when calculating the energy demand.

	kWh/m ² /y
Baseline - Existing building	106.0
Existing building + Approved Extensions	40.6
Proposed New Construction scenario	4.40

According to the assessment, because of the retained elements in the existing building + approved extensions scenario, the following applies:

- The air permeability target of the existing building + approved extensions scenario will be higher than in the New Construction. Therefore, the New Construction scenario will perform better than the refurbished scenario in terms of energy consumption.
- The thermal bridging-related heat loss will be higher in the existing building + approved extensions scenario (assuming a default Y-value of 0.2) compared to the New Construction, which benefits from improved psi-values.
- The heat loss through the building fabric will be higher in the existing building + approved extensions scenario due to limitations on achieving lower U-values for the retained elements (limitation on insulation thickness due to condensation risk).
- Lighting energy demand will be higher in the scenario of the existing building with approved extensions due to a greater Gross Internal Area (GIA) compared to the New Construction scenario.

Therefore, the New Construction scenario will perform better than the existing building + approved extensions scenario in terms of energy consumption.

The results of the WLC assessment over 60 years do not consider any future decarbonisation for construction products.

Operational energy: Not decarbonised - to 'SAP 10.2' (PART L 2021).

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Construction Site emissions

Approved Extension scenario

Based on the input from Basement contractor following construction site impacts have been included in the Approved Extension scenario.

As the approved extension has double basement it will require the following additional work.

Equipment requirement

A Retro Fit basement would require a minimum of two small excavators working in restricted space, electrical conveyors (often three phase) to remove the spoil from beneath the house, and a large excavator in the front garden to load lorries.

Materials and labour

A Retro Fit basement would require approximately two to three times the labour input due to restricted space. Timber shuttering is greater as large reusable shutter panels are not practical and therefore small bespoke shutter panels would be required.

Concrete is delivered in small loads for each underpin increasing traffic and lorry movements.

Piles

A top-down Retro Fit basement would require temporary piles to support a new R.C. raft foundation/slab for the house (below which the underpins and excavation occur).

There would be a requirement for approximately 50 additional temporary piles that would be installed with a smaller limited access piling rig over circa three weeks and require circa 120m³ additional concrete and 10 ton of additional steel reinforcement.

It would take an additional four weeks of plant and labour to remove these temporary piles from the excavated living space once the structure is complete.

- 5,560 m total drilling
- 180 hrs of excavator work
- 350 hrs of dump truck

New Construction scenario

Based on the input from Basement contractor following construction site impacts have been included in the new construction scenario.

Equipment, material, and labour requirement

A new-build basement on an open site would only require a single large excavator.

The labour hours and materials for new construction are modelled using the standard construction approach.

The equipment requirement is provided below for the new construction scenario.

- 1,358 m total drilling
- 85 hrs of excavator work
- 124 hrs of dump truck

Piles

The piling strategy for the new construction is based on the standard construction approach. 272 no. of Secant wall piles, depth: 5 m, diameter: ø450mm, 600mm spacing

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LCA Comparison Results

Whole life carbon results comparison

The following presents the whole life carbon results comparison for the Approved Extension scenario based on the two past approved planning applications and the proposed New Construction. Whole life carbon refers to the carbon emissions from all life cycle stages of a building from cradle to grave, including operational energy and water, over the study period of 60 years. The demolition or 'End of Life' (C) of the existing structure has been reported separately.

The carbon emissions of the Approved Extension and New Construction scenario are approximately:

Carbon emissions	Approved Extension	New Construction	% diff. in emission for new build
Demolition emission existing house (C)	0 kgCO ₂ e/m ²	29 kgCO ₂ e/m ²	
Upfront embodied carbon (A1-A5)	555 kgCO ₂ e/m ²	544 kgCO ₂ e/m ²	2% ↓
Whole life embodied carbon (A-C, exc. B6 -B7)	742 kgCO ₂ e/m ²	729 kgCO ₂ e/m ²	2% ↓
Total whole life carbon (A-C)	1,080 kgCO ₂ e/m ²	823 kgCO ₂ e/m ²	31% ↓

At the time of practical completion (year 0), the New Construction scenario exhibits a modest (2%) reduction in embodied carbon compared to the Approved Extension scenario. This difference arises primarily from the carbon emissions from demolition of the existing building offset by the increased carbon embodied in the larger, double-storey basement of the Approved Extension scenario. Moreover, it's important to note that the Approved Extension scenario presents substantially higher operational impacts than the New Construction scenario. This difference ultimately results in a significant 31% reduction in total whole life carbon emissions over the entire 60-year life cycle when opting for the new construction over the approved extension scenarios.

Whole life carbon results based on Module

The following presents the whole life carbon results comparison for the Approved Extension scenario based on the two past approved planning applications and the proposed New Construction based on different modules.

The carbon emissions of the Approved Extension and New Construction scenario are approximately:

Life Cycle Stage/Module	Approved Extension GWP [kg CO ₂ eq.]	New Construction GWP [kg CO ₂ eq.]
Demolition of existing building (C)	Not applicable	52,819
Construction product stage (A1-A3)	1,112,633	926,815
Transportation to site (A4)	40,025	20,881
Construction installation process (A5)	175,837	91,245
Replacement and refurbishment (B4-B5)	284,180	271,926
Operational Energy - Regulated (B6a)	667,937	45,231
Operational Energy - Unregulated (B6b)	138,336	129,744
Operational Water (B7)	2,762	2,762
End of Life (C)	162,682	81,578
TOTAL	2,496,599	1,528,897
Total biogenic carbon (A1-A3)	87,793	41,285
Future reuse, recovery, and recycling (D)	-381,836	-250,060

The D stage has been calculated as a potential figure, based upon OneClick default assumptions.

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Approved Extension scenario based on approved planning applications.

Figures 3 and 4 show the breakdown of whole life carbon by high level elemental categories for the Approved Extension and New Construction case.

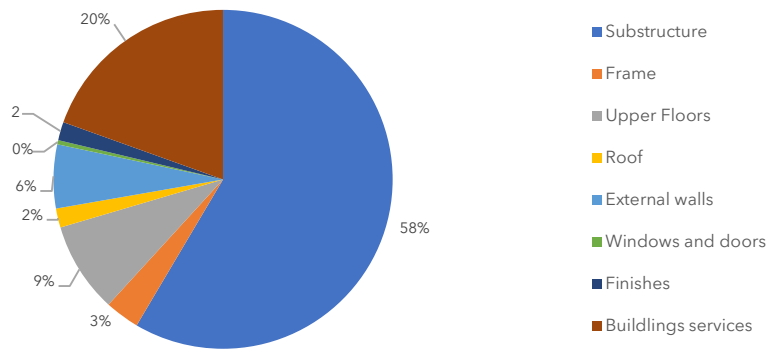


Figure 3: Whole life carbon breakdown by element for the Approved Extension [GWP, kg CO₂e]]

New Construction scenario with demolition

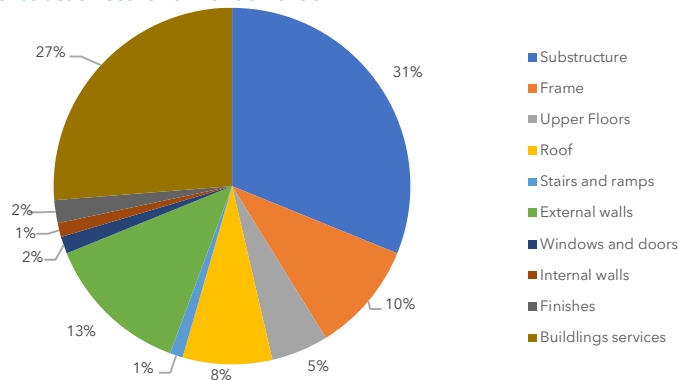


Figure 4: Whole life carbon breakdown by element for the New Construction scenario [Global warming potential [GWP, kg CO₂e]]

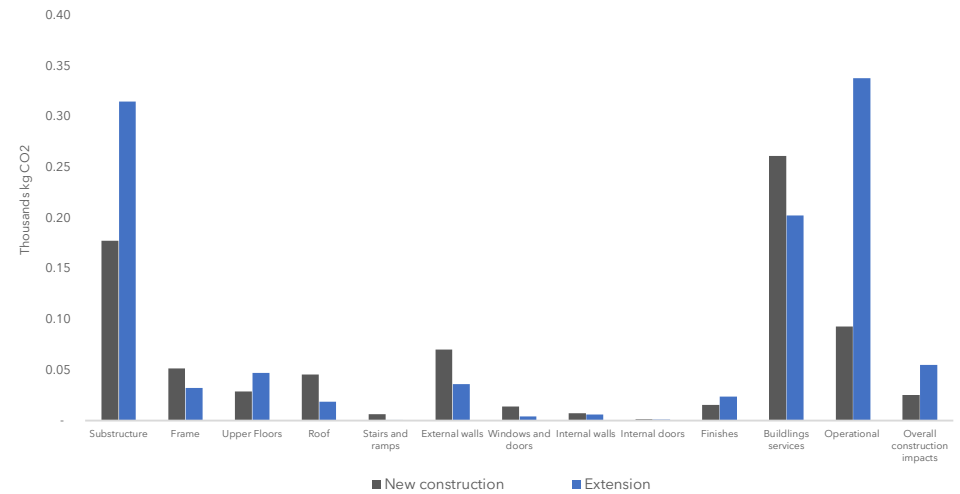


Figure 5: Whole life carbon breakdown by element for the Approved Extension and New Construction scenario [Global warming potential [GWP, kg CO₂e]]

Figure 5 provides a detailed comparative breakdown of whole life carbon by elemental categories for both the Approved Extension and New Construction cases. It is evident that in the New Construction scenario, emissions from the frame, roof, external wall, windows, doors, and building services (Car lift is also one of the biggest attributers) are higher due to the entire construction of a new house. In the Approved Extension scenario, substructure emissions are notably higher, primarily attributed to a 40% larger basement area. Additionally, operational emissions for the Approved Extension case surpass those of the New Construction case.

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Cumulative Carbon comparison

The New construction scenario is marginally better than the approved extension scenario at year 0. However, as the yearly operational carbon is higher for the Approved Extension scenario, the cumulative carbon impact over the study period is significantly higher than the New Construction scenario. The building life is assumed to be 60 years and all end-of-life impacts take place at Year 60.

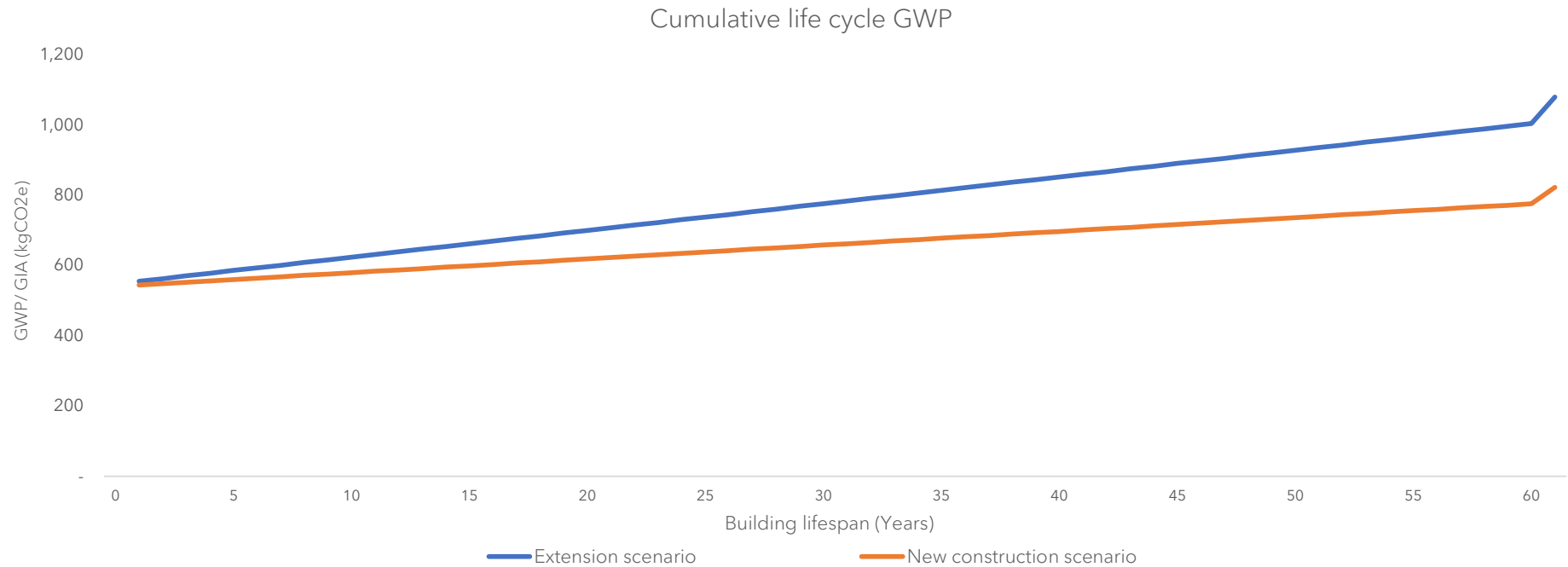


Figure 5: Comparison of cumulative GWP (kgCO_{2e}) by study period year for Approved Extension and New Construction scenario

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Conclusions

At the time of practical completion (year 0), the New Construction scenario exhibits a modest (2%) reduction in embodied carbon compared to the Approved Extension scenario. This difference arises primarily from the carbon emissions from demolition of the existing building offset by the increased carbon embodied in the larger, double-storey basement of the Approved Extension scenario. Moreover, it's important to note that the Approved Extension scenario presents substantially higher operational impacts than the New Construction scenario. This difference ultimately results in a significant 31% reduction in total whole life carbon emissions over the entire 60-year life cycle when opting for the new construction over the approved extension scenarios. Please see the energy assessment report by Eight Versa.

If the New Construction scenario is chosen, then total saving of **1,014,209 kgCO_{2e}** can be achieved over 60 years.

It needs to be noted that the impact of future decarbonisation has not been included in this assessment and the savings is therefore likely to be larger.

The results show that the New Construction scenario performs better than the Refurbishment scenario in terms of carbon emissions and will also have the following benefits:

- The poor condition of the existing building could be of concern, such as the quality of the materials and structural elements. These materials might need to be replaced or repaired within a few years. Minimal maintenance, repair and replacement will be required with new materials.
- The improved thermal performance of the dwelling will increase comfort, reduce energy consumption and costs for residents.
- The proposed New Construction features more space and a more comfortable layout which would be beneficial to the residents and fit their needs both at present and long term.

Recommendations for further work

There is a potential to further reduce the CO₂ emissions of the New Construction by considering the following measures.

- 1) Pre demolition audit to be conducted to assess the condition of existing material and incorporate material reuse on the project.
- 2) All waste materials arising from the demolition of the existing building should be considered for reuse or recycling in this project or elsewhere. The external wall brickwork for example could be carefully dismantled and reused. Concrete rubble could be crushed and recycled to aggregate to further decrease emissions.
- 3) Circular economy principles to be incorporated in the design decision making.

It should be noted that when implementing more sustainable materials specification, careful consideration should also be given to the lifespan of a given material or element options as multiple replacements can significantly increase the embodied carbon emissions.

A subsequent analysis could be undertaken at a later stage (Stage 4) or post-construction (RIBA Stage 6). During advanced design stages, it is expected that major assumptions will be eliminated as accounting for Environmental Product Declarations where possible.

The New Construction assessment concludes that the greatest source of whole life carbon emissions over the study period is caused by construction stage (A1-A3) followed by Replacements (B4-5) and operational energy (B6). The sub structure has the highest impact in comparison with the other elemental categories.

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Appendix A - Approved Extension - Detailed reporting table

Global warming potential [GWP, kg CO2 eq.] (incl. biogenic carbon)	Construction product stage (A1-A3)	Transport to site (A4)	Construction installation process (A5)	Replacement and refurbish. (B4-B5)	Operational Energy Regulated (B6a)	Operational Energy Unregulated (B6b)	Operational Water (B7)	End of Life (C)	Modules (A1-C4)	Module (D)	Biogenic carbon
0 Demolition Works								7,851	7,851		
1 Substructure	645,328	34,283	32,149	-	-	-	40,288	41,635	753,395	(134,485)	-
2.1 Frame	36,357	446	2,117	-	-	-	37,812	37,812	39,896	(93,315)	(36,836)
2.2 Upper Floors	95,143	2,862	5,518	-	-	-	9,212	9,212	112,735	(18,330)	-
2.3 Roofs	20,246	111	1,465	4,752	-	-	18,544	18,544	29,370	(11,123)	(15,748)
2.4 Stairs and Ramps	1,234	33	-	-	-	-	47	47	1,314	(628)	-
2.5 External Walls	66,975	1,713	3,658	4,289	-	-	9,491	9,491	86,126	(11,657)	-
2.6 Windows & Doors	4,564	12	100	3,973	-	-	1,589	1,589	8,774	(637)	(1,465)
2.7 Internal Walls	7,046	60	894	-	-	-	6,019	6,019	8,444	(2,638)	(5,575)
2.8 Internal Doors	1,044	3	-	290	-	-	541	541	1,353	(26)	(524)
3 Interior finishes	19,137	141	3,117	5,913	-	-	28,779	28,779	29,441	(12,749)	(27,646)
5 Building Services	215,559	362	2,830	264,965	806,273	2,762	1,163	1,163	1,293,913	(96,249)	-
Other site impacts			123,988					-	123,988		
Total kg CO_{2e}	1,112,633	40,025	175,837	284,180	806,273	2,762	161,334	162,682	2,496,599	(381,836)	(87,793)

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Appendix A - New Construction - Detailed reporting table

Global warming potential [GWP, kg CO2 eq.] (incl. biogenic carbon)	Construction product stage (A1-A3)	Transport to site (A4)	Construction installation process (A5)	Replacement and refurbish (B4-B5)	Operational Energy Regulated (B6a)	Operational Energy Unregulated (B6b)	Operational Water (B7)	End of Life (C)	Modules (A1-C4)	Module (D)	Biogenic carbon
0 Demolition Works											
1 Substructure	288,478	12,080	17,204	-	-	-	21,408	288,478	339,170	-57,050	-
2.1 Frame	92,661	442	3,172	-	-	-	1,839	92,661	98,113	-39,085	-
2.2 Upper Floors	47,971	2,951	2,211	-	-	-	2,035	47,971	55,168	-9,883	-
2.3 Roofs	75,269	3,643	3,575	1,149	-	-	3,368	75,269	86,760	-13,516	244
2.4 Stairs and Ramps	10,861	324	663	-	-	-	311	10,861	12,159	-8,168	-
2.5 External Walls	122,134	777	8,916	638	-	-	1,476	122,134	133,941	-3,582	-
2.6 Windows & Doors	14,351	31	435	11,610	-	-	3,911	14,351	26,815	-2,684	3,524
2.7 Internal Walls	11,561	98	1,467	-	-	-	9,874	11,561	13,854	-4,327	9,146
2.8 Internal Doors	1,136	6	-	1,158	-	-	2,114	1,136	2,317	-	2,097
3 Interior finishes	19,313	133	3,051	5,657	-	-	27,682	19,313	29,561	-12,329	26,274
5 Building Services	243,081	397	2,281	251,714			1,321	243,081	498,795	-99,435	-
Operations					174,975	2,762			177,736	-	-
Other	-	-	48,269	-	-174,975	-2,762	6,239	-	48,269	-	-
TOTAL	926,815	20,881	91,245	271,926	174,975	2,762	81,578	926,815	1,528,897	-250,060	41,285

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Appendix B - Approved Extension - Schedule

Summary - AREAS				
Name	TOTAL	unit	Free notes	
Sub basement (New)	209	m2	From Drawings	
Basement (New)	946	m2	From Drawings	
Ground Floor - Pool house (New)	138	m2	From Sketchup model	
1st Floor - Pool house (New)	64	m2	From Sketchup model	
Ground Floor - Main house (Existing)	372	m2	From Brochure	
1st Floor (Existing)	307	m2	From Sketchup model	
2nd Floor (Existing)	230	m2	From Sketchup model	
Attic (Existing)	43	m2	From Brochure	
GIA (New construction)	1,357	m2		
GIA (Existing)	951	m2		
Total GIA	2,309	m2		
Summary - FACILITATING WORKS				
Demolition works				
Name	TOTAL	unit	Specifications, assumptions, free notes	
Summary - MATERIAL INVENTORY				
1. Substructure				
Name	TOTAL	unit	Specifications, assumptions, free notes	
1.1 Substructure				
All information from EAP Design drawings and Carbon designer tool				
A Secant pile wall	304	m	Perimeter from EAP dwg no. A104, depth assumed to be 10 m; C32/40 with min. 20% GGBS cement replacement, source: RICS professional statement	
B Pile Caps - Concrete	82	m3	Average dimension = 600x450 mm from EAP dwg no. A104, C32/40 with min. 20% GGBS cement replacement, source: RICS professional statement	
C Pile Caps - Reinforcement	12,310	kg	Assumed 150 kg/m3; Reinforcement with 97% recycled content, source: RICS professional statement	
D Basement Slab (Sub basement + Basement)	933	m2	Assumed 300 mm thick, C32/40 with min. 20% GGBS cement replacement, source: RICS professional statement	
E Basement wall assembly	790	m2	Includes bitumen waterproof layer, 200 mm EPS insulation, 2 layers of Concrete blockwork and mortar	
F Footing foundation for hard soils	1,357	m2	Based on new GIA to be supported	
G Frost insulation	304	m	Perimeter from EAP dwg no. A104	
2. Superstructure				
Name	TOTAL	unit	Specifications, assumptions, free notes	
2.1 Frame				
All information provided by the Structural engineer				
Columns - Concrete	9	m3	200 x 400 mm RC columns from level -3.5 to +5.5; C32/40 with min. 20% GGBS cement replacement, source: RICS professional statement	
Columns - Reinforcement	2,808	kg	Assumed 300 kg/m3; Reinforcement with 97% recycled content, source: RICS professional statement	
Steel beams	10,818	kg	From EAP Design drawings sample area = -195 m2 = 5409 kg (UC203) length= 38.26 (60 kg/m), UB152 length = 8.27 (30 kg/m), UC254 length = 22.52 (132 kg/m)	
Rafters - CLT	39	m3	47 x 150mm C24 at 400 mm C/C volume of timber for -195 m2 = 20 m3	
2.2 Upper floors				
All information from EAP Design drawings				
A Hollow core slab (Concrete + Reinforcement + 65 mm screed)	206	m2	Assumed 250 mm thick hollow core slab with reinforcement included; C40/50	
B Cast insitu slab	560	m2	Assumed 250 mm thick slab with reinforcement included; C40/50	
C PIR insulation	765	m2	100 mm thick	
2.3 Roof				
All information from EAP Design drawings				
A CLT flat roof slab	125	m2	A108 - Build up includes roof membrane, 22 mm plywood, 120 mm PIR insulation, Exterior plywood, C24 joists.	
B CLT pitched roof slab	132	m2	Slate Roof coverings including PVC membrane, CLT roof structure, rock wool insulation	
C Cast insitu slab	456	m2	For basement slab	
D Dormer windows	6	m2	Product name: Velux northlight	
E Roof lights - Pool house	21	m2	Product name: Velux	
2.4 Stairs and ramps				
A Precast concrete staircase	7	m	From level -3.5 to +3.5 (total height = 7m) for the pool house	
2.5 External walls				
All information from EAP Design drawings				
A Brick cavity wall	411	m2	Wall build up = 102.5 mm brick, 100 mm PIR insulation, breather membrane, 100 mm concrete blockwork, 12.5 mm cement board	
2.6 Windows and external doors				
A Double glazed windows	67	m2	From building performance modeling	
B Glazed Doors	27	m2	Glazed doors; from building performance modeling	
2.7 Internal walls and partitions				
All information from elemental cost plan dated 06/11/2023				
Wooden stud internal walls	743	m2	2 Layers of gypsum plasterboard, 100 mm glasswool insulation and timber stud wall system quantity based on OCL carbon designer tool	
2.8 Internal doors				
A Solid core timber + Bifold door	22	m2	From Dwg A109 by EAP design	
B Glazed door	7	m2	From Dwg A109 by EAP design	
C Bifold door fittings	1	#	From Dwg A109 by EAP design	
3. Internal finishes				
Name	TOTAL	unit	Specifications, assumptions, free notes	
3.1 Wall finishes				
General Wall Finish	2,358	m2	Emulsion Paint, quantity based on OCL carbon designer tool	
Ceramic Tiles	354	m2	Dormer or similar to bathrooms and kitchens	
3.2 Floor finishes				
Wood Flooring	1,290	m2	Parquet flooring, quantity based on OCL carbon designer tool	
Floor tiles (Kitchen + Bathroom)	19	m2	Areas from Dwg A114	
Floor tiles (Pool)	48	m2	Areas from Dwg A114	
3.3 Ceiling finishes				
Single layer plasterboard on suspension system	1,357	m2	Painted plasterboard ceilings throughout	
4. Fittings, furnishings & equipment				
Name	TOTAL	unit	Specifications, assumptions, free notes	
4.1 Fittings, furnishings & equipment				
Kitchens				
5. Core building services				
Name	TOTAL	unit	Specifications, assumptions, free notes	
5.1 Sanitary installations				
Sink	5	nr	Porcelain sink assumed	
Water closet	3	nr	Ceramic	
Shower/bath tubs	2	nr		
5.2 Service equipment				
Not applicable as per cost plan				
5.3 Disposal installations				
Sewage water system for single family house	1,357	m2	GIA based template	
5.4 Water installations				
Water supply system for single family house	1,357	m2	GIA based template	
5.5 Heat source				
Ground source heat pump	1,357	m2	Ground source heat pump building installation, 150W, installation consists of: heat exchangers, compressor, HDPE collector pipes, work fluids, circulation pumps	
5.6 Space heating and air conditioning				
Space heating	1,357	m2	GIA based template	
5.7 Ventilation systems				
Mechanical Ventilation Heat Recovery (MVHR)	1,357	m2	GIA based template	
5.8 Electrical installations				
Electric cabling for single family house	1,357	m2	GIA based template	
Lighting system for single family house	1,357	m2	GIA based template	
5.9 Fuel installations and systems				
Not applicable				
5.10 Lift and conveyor installations or systems				
Elevator	1	#	8 person lift; Ground floor to roof	
5.11 Fire and lightning protection				
Fire protection and detection system single family house	1,357	m2	GIA based template	
Lightning protection system for single family house	1,357	m2	GIA based template	
5.12 Communication, security and control systems				
Communication system for single family house	1,357	m2	GIA based template	
5.13				
Earthing system for single family house	1,357	m2	GIA based template	
Photovoltaic panels (monocrystalline)	310	m2	Based on marked up roof Dwg 304 Rev A dated 01/11/2023 by Rundell Associates	
8. External works				
Name	TOTAL	unit	Specifications, assumptions, free notes	
8.2 Roads paths and pavings				
Not applicable				

A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg	44.14	30.9	As building
A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg	95.05	66.54	As building
A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg	342.22	239.58	As building
A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg	391.54	274.11	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg	578.88	71.15	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg	1344	165.19	As building
A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg	1709.04	1196.48	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg	2267.92	277.52	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg	2384.64	293.09	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg	11276.16	1385.92	As building
A5	2.1. Frame				20423.58	4000.47	
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		0	As building
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		0	As building
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		0	As building
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		0	As building
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		0	As building
B3	2.1. Frame						
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		34.85	As building
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		75.04	As building
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		270.19	As building
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		309.14	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		42.35	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		98.32	As building
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		1349.35	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		165.18	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		174.45	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		824.9	As building
C2	2.1. Frame					3343.76	
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		1.98	As building
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		4.26	As building
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		15.35	As building
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		17.56	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		5.01	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		11.62	As building
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		76.66	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		19.52	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		20.62	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		97.51	As building
C3	2.1. Frame					270.1	
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		-210.36	As building
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		-453.01	As building
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		-1631.04	As building
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		-1866.13	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		-340.09	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		-789.59	As building
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		-8145.51	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		-1326.52	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		-1400.97	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		-6624.7	As building
D	2.1. Frame						
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		667.96	As building
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		1438.53	As building
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		5179.38	As building
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		5925.9	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		1849.87	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		4294.88	As building
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		25866.09	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		7215.4	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		7620.34	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		36034.03	As building
TOTAL	2.1. Frame						
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		0	As building
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		0	As building
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		0	As building
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		0	As building
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		0	As building
bioC	2.1. Frame						
bioC	2.1. Frame				519700.33	96092.4	
A1-A3	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3	367200	38005.96	As building
A1-A3	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg	20593	9965.29	As building
A1-A3	2.2. Upper floor				387793	47971.25	
A4	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		2864.16	As building
A4	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		86.74	As building
A4	2.2. Upper floor					2950.9	
A5	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3	14688	1682.86	As building
A5	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg	998.76	527.94	As building
A5	2.2. Upper floor				15686.76	2210.81	
B3	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		0	As building
B3	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		0	As building
B3	2.2. Upper floor						
C2	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		1074.49	As building
C2	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		788.56	As building
C2	2.2. Upper floor					1863.05	
C3	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		127.01	As building
C3	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		44.8	As building
C3	2.2. Upper floor					171.81	
D	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		-8454.82	As building
D	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		-1428.06	As building
D	2.2. Upper floor						
TOTAL	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		43754.48	As building
TOTAL	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		11413.34	As building
TOTAL	2.2. Upper floor						
bioC	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		0	As building
bioC	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		0	As building
bioC	2.2. Upper floor						
bioC	2.2. Upper floor				403479.76	55167.82	
A1-A3	2.3. Roofs	Roof window (skylight), biogenic CO2 not subtracted (for CML), 35.66 kg/m2, Fen	13	m2		1128.25	40
A1-A3	2.3. Roofs	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	184	m3		453.58	As building
A1-A3	2.3. Roofs	Concrete roof tiles, Avg. thickness per m2: 22.4 mm, 33x42x20 mm, 2100 kg/m3 (E	918	m2		1817.0	As building
A1-A3	2.3. Roofs	Geotextile, generic, 312 g/m2 (1.02 oz/ft2), Composition: PP net, non-woven PE f	918	m2		286.42	60
A1-A3	2.3. Roofs	Rock wool insulation panels, unfaced, generic, L = 0.037 W/mK, R = 2.70 m2K/W	918	m2		6885	As building
A1-A3	2.3. Roofs	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	918	m2		1377	60
A1-A3	2.3. Roofs	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	22952	kg		22952	As building
A1-A3	2.3. Roofs				502481	75268.65	
A4	2.3. Roofs	Roof window (skylight), biogenic CO2 not subtracted (for CML), 35.66 kg/m2, Fen	13	m2		2.31	40
A4	2.3. Roofs	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	184	m3		3444.48	As building
A4	2.3. Roofs	Concrete roof tiles, Avg. thickness per m2: 22.4 mm, 33x42x20 mm, 2100 kg/m3 (E	918	m2		66.44	As building

B4	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2		1158.25	40
B5	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2	0	0	40
C2	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2		4.38	40
C3	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2		2109.1	40
C3	2.8.Internal doors					2109.1	
C4	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2		0.59	40
D	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2		0	40
TOTAL	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2		2316.51	40
bioC	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2		-2097.33	40
bioC	2.8.Internal doors					-2097.33	
A1-A3	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		1144	30
A1-A3	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		2784	15
A1-A3	3.1.Wall finishes					2933	
A4	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		6.4	30
A4	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		1.8	15
A4	3.1.Wall finishes					8.19	
A5	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		278.4	30
A5	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		14.9	15
A5	3.1.Wall finishes					293.3	
B3	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		0	30
B3	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		0	15
B3	3.1.Wall finishes						
B4	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		29.06	30
B4	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		732.68	15
B4	3.1.Wall finishes					761.74	
B5	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2	0	0	30
B5	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2	0	0	15
B5	3.1.Wall finishes						
C2	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		8.15	30
C2	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		0.44	15
C2	3.1.Wall finishes					8.58	
C3	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		0.96	30
C3	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		0	15
C3	3.1.Wall finishes					0.96	
C4	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		0.39	15
D	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		-22.95	30
TOTAL	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		61.02	30
TOTAL	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		1001.34	15
TOTAL	3.1.Wall finishes						
bioC	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2		0	30
bioC	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2		0	15
bioC	3.1.Wall finishes						
A1-A3	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2		3226.3	As building
A1-A3	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2		152.46	20
A1-A3	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2		141	20
A1-A3	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		131.6	30
A1-A3	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		60.17	As building
A1-A3	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		2256	30
A1-A3	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		22.75	10
A1-A3	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2		226.81	30
A1-A3	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2		15460.82	As building
A1-A3	3.2.Floor finishes					18391.44	
A4	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2		0.47	As building
A4	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2		1.7	20
A4	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2		6.3	As building
A4	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		5.18	30
A4	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		0.27	10
A4	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2		0.69	30
A4	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2		76.96	As building
A4	3.2.Floor finishes					85.59	
A5	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2		6.1	As building
A5	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2		14.1	20
A5	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2		17.11	As building
A5	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		225.6	30
A5	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		2.28	10
A5	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2		22.68	30
A5	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2		2767.49	As building
A5	3.2.Floor finishes					3055.35	
A5	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2		0	As building
A4	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2		0	20
B3	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2		0	As building
B3	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		0	30
B3	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		0	10
B3	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2		0	30
B3	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2		0	As building
B3	3.2.Floor finishes						
B4	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2		234.85	20
B4	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		1496.27	30
B4	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		329.33	10
B4	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2		1042.15	30
B4	3.2.Floor finishes					3102.6	
B5	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2	0	0	20
B5	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2	0	0	30
B5	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2	0	0	10
B5	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2	0	0	30
B5	3.2.Floor finishes						
C2	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2		0.58	As building
C2	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2		0.41	20
C2	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2		0.39	As building
C2	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		6.6	30
C2	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		0.067	10
C2	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2		0.87	30
C2	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2		59.2	As building
C2	3.2.Floor finishes					68.12	
C3	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2		314.89	As building
C3	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2		0	20
C3	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2		0.046	As building
C3	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		0.78	30
C3	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		0	10
C3	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2		468.45	30
C3	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2		26472.93	As building
C3	3.2.Floor finishes					27257.09	
C4	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2		0.37	20
C4	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		0.059	10
C4	3.2.Floor finishes					0.43	
D	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2		-218.32	As building
D	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2		-2.33	As building
D	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		-18.6	30
D	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2		-712.49	30
D	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2		-11316.42	As building
D	3.2.Floor finishes						
TOTAL	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2		1047.45	As building
TOTAL	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2		364.02	20
TOTAL	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2		68.82	As building
TOTAL	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2		3142.16	30
TOTAL	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2		401.78	10

D	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310 m2			-26756.67	20
D	5.13.Special installations						
TOTAL	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892 unit			106.9	30
TOTAL	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047 kg			1329.06	30
TOTAL	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310 m2			240631.34	20
TOTAL	5.13.Special installations						
bioC	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892 unit			0	30
bioC	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047 kg			0	30
bioC	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310 m2			0	20
bioC	5.13.Special installations						
	5.13.Special installations					4780.52	242067.31
A1-A3	5.3.Disposal installations	Interior floor drain, DN = 100 mm, 2.87 kg/unit, Siphon de sol intérieur DN évacuat	22.94 unit			65.84	As building
A1-A3	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			855.48	As building
A1-A3	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			1159.37	As building
A1-A3	5.3.Disposal installations					2080.68	4949.21
A4	5.3.Disposal installations	Interior floor drain, DN = 100 mm, 2.87 kg/unit, Siphon de sol intérieur DN évacuat	22.94 unit			0.61	As building
A4	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			8.73	As building
A4	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			11.83	As building
A4	5.3.Disposal installations					21.17	
A5	5.3.Disposal installations	Interior floor drain, DN = 100 mm, 2.87 kg/unit, Siphon de sol intérieur DN évacuat	22.94 unit			0	As building
A5	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			51.33	As building
A5	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			69.56	As building
A5	5.3.Disposal installations					120.89	263.4
B3	5.3.Disposal installations	Interior floor drain, DN = 100 mm, 2.87 kg/unit, Siphon de sol intérieur DN évacuat	22.94 unit			0	As building
B3	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			0	As building
B3	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			0	As building
B3	5.3.Disposal installations						
C2	5.3.Disposal installations	Interior floor drain, DN = 100 mm, 2.87 kg/unit, Siphon de sol intérieur DN évacuat	22.94 unit			0.19	As building
C2	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			32.76	As building
C2	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			44.4	As building
C2	5.3.Disposal installations					77.35	
C3	5.3.Disposal installations	Interior floor drain, DN = 100 mm, 2.87 kg/unit, Siphon de sol intérieur DN évacuat	22.94 unit			0	As building
C3	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			2.94	As building
C3	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			3.99	As building
C3	5.3.Disposal installations					6.93	
C4	5.3.Disposal installations	Interior floor drain, DN = 100 mm, 2.87 kg/unit, Siphon de sol intérieur DN évacuat	22.94 unit			0.17	As building
C4	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			0.22	As building
C4	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			0.3	As building
C4	5.3.Disposal installations					0.7	
D	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			-1799.27	As building
D	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			-2438.42	As building
D	5.3.Disposal installations						
TOTAL	5.3.Disposal installations	Interior floor drain, DN = 100 mm, 2.87 kg/unit, Siphon de sol intérieur DN évacuat	22.94 unit			665.33	As building
TOTAL	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			1778.66	As building
TOTAL	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			2874.76	As building
TOTAL	5.3.Disposal installations						
bioC	5.3.Disposal installations	Interior floor drain, DN = 100 mm, 2.87 kg/unit, Siphon de sol intérieur DN évacuat	22.94 unit			0	As building
bioC	5.3.Disposal installations	Polypropylene pipe for drainage network, 5.18 kg/m, PP Master 10 DN 200, PP M	165.15 m			0	As building
bioC	5.3.Disposal installations	PVC pipes for water supply networks, Dia = 110 - 160 mm, Thickness = 2.4 - 3.5 r	357.83 m			0	As building
bioC	5.3.Disposal installations						
	5.3.Disposal installations					2201.57	5318.75
A1-A3	5.4.Water installations	Thermostatic water mixer, for collective use, 2.7kg, Mitigeur thermostatique collect	9.18 unit			25.19	As building
A1-A3	5.4.Water installations	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=repartiteur=clarine	9.18 unit			58.34	As building
A1-A3	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			6.43	As building
A1-A3	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			150.88	As building
A1-A3	5.4.Water installations	Polypropylene water supply plumbing, French average, DN=110mm, Réseau d'ad	344.063 m			3543.85	As building
A1-A3	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			4556.12	As building
A1-A3	5.4.Water installations					1941.11	8599.43
A4	5.4.Water installations	Thermostatic water mixer, for collective use, 2.7kg, Mitigeur thermostatique collect	9.18 unit			0.23	As building
A4	5.4.Water installations	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=repartiteur=clarine	9.18 unit			0.06	As building
A4	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			0.098	As building
A4	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			0.51	As building
A4	5.4.Water installations	Polypropylene water supply plumbing, French average, DN=110mm, Réseau d'ad	344.063 m			7.02	As building
A4	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			11.15	As building
A4	5.4.Water installations					19.07	
A5	5.4.Water installations	Thermostatic water mixer, for collective use, 2.7kg, Mitigeur thermostatique collect	9.18 unit			0	As building
A5	5.4.Water installations	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=repartiteur=clarine	9.18 unit			0	As building
A5	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			0.58	As building
A5	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			3.03	As building
A5	5.4.Water installations	Polypropylene water supply plumbing, French average, DN=110mm, Réseau d'ad	344.063 m			0	As building
A5	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			65.55	As building
A5	5.4.Water installations					69.15	291.57
B3	5.4.Water installations	Thermostatic water mixer, for collective use, 2.7kg, Mitigeur thermostatique collect	9.18 unit			0	As building
B3	5.4.Water installations	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=repartiteur=clarine	9.18 unit			0	As building
B3	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			0	As building
B3	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			0	As building
B3	5.4.Water installations	Polypropylene water supply plumbing, French average, DN=110mm, Réseau d'ad	344.063 m			0	As building
B3	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			0	As building
B3	5.4.Water installations						
C2	5.4.Water installations	Thermostatic water mixer, for collective use, 2.7kg, Mitigeur thermostatique collect	9.18 unit			0.074	As building
C2	5.4.Water installations	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=repartiteur=clarine	9.18 unit			0.019	As building
C2	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			0	As building
C2	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			1.93	As building
C2	5.4.Water installations	Polypropylene water supply plumbing, French average, DN=110mm, Réseau d'ad	344.063 m			2.21	As building
C2	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			41.83	As building
C2	5.4.Water installations					46.44	
C3	5.4.Water installations	Thermostatic water mixer, for collective use, 2.7kg, Mitigeur thermostatique collect	9.18 unit			0	As building
C3	5.4.Water installations	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=repartiteur=clarine	9.18 unit			0	As building
C3	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			0.033	As building
C3	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			0.17	As building
C3	5.4.Water installations	Polypropylene water supply plumbing, French average, DN=110mm, Réseau d'ad	344.063 m			0	As building
C3	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			3.76	As building
C3	5.4.Water installations					3.96	
C4	5.4.Water installations	Thermostatic water mixer, for collective use, 2.7kg, Mitigeur thermostatique collect	9.18 unit			0.065	As building
C4	5.4.Water installations	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=repartiteur=clarine	9.18 unit			0	As building
C4	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			0.0025	As building
C4	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			0.013	As building
C4	5.4.Water installations	Polypropylene water supply plumbing, French average, DN=110mm, Réseau d'ad	344.063 m			1.97	As building
C4	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			0.28	As building
C4	5.4.Water installations					2.35	
D	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			-20.26	As building
D	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			-106.13	As building
D	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			-2297.7	As building
D	5.4.Water installations						
TOTAL	5.4.Water installations	Thermostatic water mixer, for collective use, 2.7kg, Mitigeur thermostatique collect	9.18 unit			198.25	As building
TOTAL	5.4.Water installations	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=repartiteur=clarine	9.18 unit			58.43	As building
TOTAL	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			98.44	As building
TOTAL	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			162.72	As building
TOTAL	5.4.Water installations	Polypropylene water supply plumbing, French average, DN=110mm, Réseau d'ad	344.063 m			3555.05	As building
TOTAL	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			4889.93	As building
TOTAL	5.4.Water installations						
bioC	5.4.Water installations	Thermostatic water mixer, for collective use, 2.7kg, Mitigeur thermostatique collect	9.18 unit			0	As building
bioC	5.4.Water installations	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=repartiteur=clarine	9.18 unit			0	As building
bioC	5.4.Water installations	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	32.113 unit			0	As building
bioC	5.4.Water installations	PEX pipes for tap water and heating systems, Diameter: 12-50 mm, Combi Pipe (L	50.46 kg			0	As building
bioC	5.4.Water installations	Polypropylene water supply plumbing, French average, DN=110mm, Réseau d'ad	344.063 m			0	As building
bioC	5.4.Water installations	Polyethylene gas supply plumbing, Diam. Ext. = 60mm, ép. paroi = 10mm, Réseaul	674.36 m			0	As building

B6b	5.Services	Electricity, United Kingdom, SAP 10.1 and 10.2	15900	kWh	129744
B7	5.Services	Tap water, clean - Thames Water Utilities Ltd	350	m3	411.6
B7	5.Services	Wastewater - Thames Water Utilities Ltd	350	m3	2349.9
B7	5.Services				2761.5
TOTAL	5.Services	Tap water, clean - Thames Water Utilities Ltd	350	m3	411.6
TOTAL	5.Services	Wastewater - Thames Water Utilities Ltd	350	m3	2349.9
TOTAL	5.Services	Electricity, United Kingdom, SAP 10.1 and 10.2	5543	kWh	45230.88
TOTAL	5.Services	Electricity, United Kingdom, SAP 10.1 and 10.2	15900	kWh	129744
TOTAL	5.Services				177736.38
A5	Other site construction or overall construction stage	Average construction site impacts, scenario for temperate and southern climate, E	1835	m2	25524.85
TOTAL	Other site construction or overall construction stage	Average construction site impacts, scenario for temperate and southern climate, E	1835	m2	25524.85
	Other site construction or overall construction stage				25524.85

Whole Life Carbon Comparison Study

Radlett House

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Appendix B - New Construction - Schedule

Summary - AREAS				
Name	TOTAL	unit	Free notes	
Basement	733	m2	From Rundell Associates Dwg No. 300, includes the connection between main house and small house	
Ground Floor - Main house	444	m2	From Rundell Associates Dwg No. 301, includes the connection between main house and small house	
Ground Floor - Small house	175	m2	From Sketchup model	
1st Floor	354	m2	From Rundell Associates Dwg No. 302, includes the connection between main house and small house	
Ground Floor - Small house	120	m2	From Sketchup model	
2nd Floor	83	m2	From Rundell Associates Dwg No. 303, includes the connection between main house and small house	
TOTAL GIA of scheme	1909	m2	One Click updated on 18.04.24	
GIA for small house	295	m2		
GIA for main house	1614	m2		

Summary - FACILITATING WORKS				
0. Facilitating works	Name	TOTAL	unit	Specifications, assumptions, free notes
	Demolition			

Summary - MATERIAL INVENTORY				
1. Substructure	Name	TOTAL	unit	Specifications, assumptions, free notes
1.1 Substructure				
	A Secant pile wall	272	no. of piles	Secant wall piling per pile, depth: 5 m, diameter: ø450mm, 600mm spacing. One Click updated on 18.04.24 (Refer to Secant pile calculation sheet for detail)
	B Frost insulation (EPS)	163	m	Frost insulation is placed around perimeter of outer wall, width of insulation 600 mm, One Click LCA data
	C Footing foundation - Concrete	88,819	kg	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA, Includes: point and strip footings, One Click LCA data
	C Footing foundation - Reinforcement	5,780	kg	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA, Includes: point and strip footings, One Click LCA data
	D Basement reinforced concrete slab assembly	697	m2	Includes 50 mm cleanliness layer, 300 mm concrete, reinforcement, 200 mm EPS insulation, 0.2 mm vapour control layer, 20 mm self levelling mortar
	E Basement wall assembly	562	m2	Includes bitumen waterproof layer, 200 mm EPS insulation, 2 layers of Concrete blockwork and mortar
	F Ground floor slab main house + garage floor	360	m2	Includes 50 mm cleanliness layer, 300 mm concrete, reinforcement, 200 mm EPS insulation, 0.2 mm vapour control layer, 20 mm self levelling mortar based on emissions from machine hours required to excavate volume of soil (Detailed calculations in Excavation sheet)
	G Groundwork	4,126	m3	
2. Superstructure				
2.1 Steel Frame				Updated on 18.04.24, All information is from OneClick Carbon designer tool by modeling the area of house
	A Columns	101	m	Steel column, UC 203x203x52, 9 m c/c steel column spacing
	B Beam (Primary)	414	m	Steel beam, UB 406x178x60
	B Beam (Secondary)	311	m	Secondary steel beam, UB 305x127x37
	C Connecting parts	167	kg	
2.2 Upper floors				
	Reinforced concrete slab - Concrete	165	m2	100 mm thick ribdeck slab, C32/40 with 20% recycled content, Steel with 97% recycled content
	Reinforced concrete slab - Reinforcement	20,593	m2	125 kg/m3 reinforcement density, Steel with 97% recycled content
2.3 Roof				
	Reinforced concrete slab - Concrete	184	m3	200 mm thick reinforced concrete slab, C32/40 with 20% recycled content, Steel with 97% recycled content
	Reinforced concrete slab - Reinforcement	22,952	m2	125 kg/m3 reinforcement density, Steel with 97% recycled content
	Waterproofing membrane system + Insulation	918	m2	
	Roof light	13	m2	Area from sketchup model
2.4 Stairs and ramps				
	Staff unit stairs - Concrete staircase	7	m	Precast concrete stair
	Residential unit stairs - Steel straight staircase	14	m	Steel frame stair, updated on 18.04.24
2.5 External walls				
	Masonry cavity wall	1,345	m2	Area from Sketchup. 140mm Blockwork, 175mm Insulation, 100mm Brick, 12.5 mm Gypsum plasterboard and mortar Updated on 18.04.24
2.6 Windows and external doors				
	A Windows	291	m2	Area from energy model sheet
	B External Doors	11	m2	Area from doors sheet
2.7 Internal walls and partitions				
	A Internal walls and partitions	1,219	m2	Wooden internal walls, area from internal walls sheet
2.8 Internal doors				
	A Internal doors	88	m2	Wooden doors, quantities from OCL carbon designer tool
3. Internal finishes				
3.1 Wall finishes				
	All areas (except bathrooms)	987	m2	
	Bathrooms	232	m2	
3.2 Floor finishes				
	Basement	474	m2	
	Residential - Communal areas (upper floors)	1,300	m2	Timber/ stone/ clay
	Bathroom floor area	94	m2	Ceramic tiles
	Pool	42	m2	Ceramic tiles
3.3 Ceiling finishes				
	All areas (except basement)	1,435	m2	
4. Fittings, furnishings & equipment				
	4.1 Fittings, furnishings & equipment			
	NONE	/	/	Provision deemed unfurnished
5. Core building services				
5.1 Sanitary installations				
	Toilet	14	units	Porcelain sink assumed
	Sink	14	units	Ceramic
	Shower	11	units	
5.2 Service equipment				
	Combined with 5.4			
5.3 Disposal installations				
	Sewage water system for single family house	1,909	m2	GIA based template
5.4 Water installations				
	Water supply system for single family house	1,909	m2	GIA based template
5.5 Heat source				
	Ground source heat pump	1,909	m2	Ground source heat pump building installation, 150kW, installation consists of: heat exchangers, compressor, HDPE collector pipes, work fluids, circulation pumps
5.6 Space heating and air conditioning				
	Space heating	1,909	m2	GIA based template
5.7 Ventilation systems				
	Mechanical Ventilation Heat Recovery (MVHR)	1,909	m2	GIA based template
5.8 Electrical installations				
	Electric cabling for single family house	1,909	m2	GIA based template
	Lighting system for single family house	1,909	m2	GIA based template
5.9 Fuel installations and systems				
	NONE			
5.10 Lift and conveyor installations or systems				
	Lifts x N. floors	1	#	Car lift (The elevator with highest capacity on One click modeled, 7800 kg)
5.11 Fire and lightning protection				
	Fire protection and detection system for single family house	1,909	m2	GIA based template
	Lightning protection system for single family house	1,909	m2	GIA based template
5.12 Communication, security and control systems				
	Communication system for single family house	1,909	m2	GIA based template
5.13 Special installations or systems				
	Earthing system for single family house	1,909	m2	GIA based template
	Photovoltaic panels (monocrystalline)	310	m2	Based on marked up roof Dwg 304 Rev A dated 01/11/2023 by Rundell Associates
5.14 General builder's work				
	Not included at this stage.			
8. External works				
	NONE			

A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg	44.14	30.9	As building
A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg	95.05	66.54	As building
A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg	342.22	239.58	As building
A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg	391.54	274.11	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg	578.88	71.15	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg	1344	165.19	As building
A5	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg	1709.04	1196.48	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg	2267.92	277.52	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg	2384.64	293.09	As building
A5	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg	11276.16	1385.92	As building
A5	2.1. Frame				20423.58	4000.47	
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		0	As building
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		0	As building
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		0	As building
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		0	As building
B3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		0	As building
B3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		0	As building
B3	2.1. Frame						
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		34.85	As building
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		75.04	As building
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		270.19	As building
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		309.14	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		42.35	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		98.32	As building
C2	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		1349.35	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		165.18	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		174.45	As building
C2	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		824.9	As building
C2	2.1. Frame					3343.76	
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		1.98	As building
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		4.26	As building
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		15.35	As building
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		17.56	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		5.01	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		11.62	As building
C3	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		76.66	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		19.52	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		20.62	As building
C3	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		97.51	As building
C3	2.1. Frame					270.1	
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		-210.35	As building
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		-453.01	As building
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		-1631.04	As building
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		-1866.13	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		-340.09	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		-789.59	As building
D	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		-8145.51	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		-1326.52	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		-1400.97	As building
D	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		-6624.7	As building
D	2.1. Frame						
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		667.96	As building
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		1438.53	As building
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		5179.38	As building
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		5925.9	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		1849.87	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		4294.88	As building
TOTAL	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		25866.09	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		7215.4	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		7620.34	As building
TOTAL	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		36034.03	As building
TOTAL	2.1. Frame						
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	910	kg		0	As building
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	1959.75	kg		0	As building
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	7056	kg		0	As building
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	8073	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	14472	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	33600	kg		0	As building
bioC	2.1. Frame	Reinforcement steel (rebar), generic, 90% recycled content, A615	35238	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	56448	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	59616	kg		0	As building
bioC	2.1. Frame	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	281904	kg		0	As building
bioC	2.1. Frame						
bioC	2.1. Frame				519700.33	96092.4	
A1-A3	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3	367200	38005.96	As building
A1-A3	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg	20593	9965.29	As building
A1-A3	2.2. Upper floor				387793	47971.25	
A4	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		2864.16	As building
A4	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		86.74	As building
A4	2.2. Upper floor					2950.9	
A5	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3	14688	1682.86	As building
A5	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg	998.76	527.94	As building
A5	2.2. Upper floor				15686.76	2210.81	
B3	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		0	As building
B3	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		0	As building
B3	2.2. Upper floor						
C2	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		1074.49	As building
C2	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		788.56	As building
C2	2.2. Upper floor					1863.05	
C3	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		127.01	As building
C3	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		44.8	As building
C3	2.2. Upper floor					171.81	
D	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		-8454.82	As building
D	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		-1428.06	As building
D	2.2. Upper floor						
TOTAL	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		43754.48	As building
TOTAL	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		11413.34	As building
TOTAL	2.2. Upper floor						
bioC	2.2. Upper floor	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	153	m3		0	As building
bioC	2.2. Upper floor	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	20593	kg		0	As building
bioC	2.2. Upper floor						
bioC	2.2. Upper floor				403479.76	55167.82	
A1-A3	2.3. Roofs	Roof window (skylight), biogenic CO2 not subtracted (for CML), 35.66 kg/m2, Fen	13	m2		1128.25	40
A1-A3	2.3. Roofs	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	184	m3		45706.51	As building
A1-A3	2.3. Roofs	Concrete roof tiles, Avg. thickness per m2: 22.4 mm, 33x42x20 mm, 2100 kg/m3 (E	918	m2		1566.53	As building
A1-A3	2.3. Roofs	Geotextile, generic, 312 g/m2 (1.02 oz/ft2), Composition: PP net, non-woven PE f	918	m2		670.41	60
A1-A3	2.3. Roofs	Rock wool insulation panels, unfaced, generic, L = 0.037 W/mK, R = 2.70 m2K/W	918	m2		8967.52	As building
A1-A3	2.3. Roofs	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	918	m2		1122.56	60
A1-A3	2.3. Roofs	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615	22952	kg		11106.85	As building
A1-A3	2.3. Roofs				502481	75268.65	
A4	2.3. Roofs	Roof window (skylight), biogenic CO2 not subtracted (for CML), 35.66 kg/m2, Fen	13	m2		2.31	40
A4	2.3. Roofs	Ready-mix concrete, normal strength, generic, C32/40 (4600/5800 PSI) with CEM	184	m3		3444.48	As building
A4	2.3. Roofs	Concrete roof tiles, Avg. thickness per m2: 22.4 mm, 33x42x20 mm, 2100 kg/m3 (E	918	m2		66.44	As building

B4	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2			1158.25		40
B5	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2	0		0		40
C2	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2			4.38		40
C3	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2			2109.1		40
C3	2.8.Internal doors						2109.1		
C4	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2			0.59		40
D	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2			0		40
TOTAL	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2			2316.51		40
bioC	2.8.Internal doors	Doors with wooden frame, interior, Portes intérieures de communication avec huis	88	m2			-2097.33		40
bioC	2.8.Internal doors						-2097.33		
A1-A3	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			1144		30
A1-A3	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			2784		30
A1-A3	3.1.Wall finishes						2933		15
A4	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			6.4		30
A4	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			1.8		15
A4	3.1.Wall finishes						8.19		
A5	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			278.4		30
A5	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			14.9		15
A5	3.1.Wall finishes						293.3		27.33
B3	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			0		30
B3	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			0		15
B3	3.1.Wall finishes								
B4	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			29.06		30
B4	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			732.68		15
B4	3.1.Wall finishes						761.74		
B5	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2	0		0		30
B5	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2	0		0		15
B5	3.1.Wall finishes								
C2	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			8.15		30
C2	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			0.44		15
C2	3.1.Wall finishes						8.58		
C3	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			0.96		30
C3	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			0		15
C3	3.1.Wall finishes						0.96		
C4	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			0.39		15
D	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			-22.95		30
TOTAL	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			61.02		30
TOTAL	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			1001.34		15
TOTAL	3.1.Wall finishes								
bioC	3.1.Wall finishes	Ceramic wall tile, 6 mm, average density 2000 kg/m3 (Mosa)	232	m2			0		30
bioC	3.1.Wall finishes	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora,	987	m2			0		15
bioC	3.1.Wall finishes								
A1-A3	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2			3226.3		1062.36
A1-A3	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2			152.46		681.23
A1-A3	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2			141		114.95
A1-A3	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	94	m2			131.6		60.17
A1-A3	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2			2256		1483.7
A1-A3	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2			22.75		65.47
A1-A3	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2			226.81		572.14
A1-A3	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2			15460.82		11129.89
A1-A3	3.2.Floor finishes						18391.44		14117.54
A4	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2			0.47		As building
A4	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2			1.7		20
A4	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2			0.3		As building
A4	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2			5.18		30
A4	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2			0.27		10
A4	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2			0.69		30
A4	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2			76.96		As building
A4	3.2.Floor finishes						85.59		
A5	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2			6.1		40.29
A5	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2			14.1		11.74
A5	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2			17.11		7.92
A5	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2			225.6		149.63
A5	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2			2.28		6.59
A5	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2			22.68		104.21
A5	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2			2767.49		2052.21
A5	3.2.Floor finishes						3055.35		2372.88
A5	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2			0		As building
A4	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2			0		20
B3	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2			0		As building
B3	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2			0		30
B3	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2			0		10
B3	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2			0		30
B3	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2			0		As building
B3	3.2.Floor finishes								
B4	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2			234.85		20
B4	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2			1496.27		30
B4	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2			329.33		10
B4	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2			1042.15		30
B4	3.2.Floor finishes						3102.6		
B5	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2	0		0		20
B5	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2	0		0		30
B5	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2	0		0		10
B5	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2	0		0		30
B5	3.2.Floor finishes								
C2	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2			0.58		As building
C2	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2			0.41		20
C2	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2			0.39		As building
C2	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2			6.6		30
C2	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2			0.067		10
C2	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2			0.87		30
C2	3.2.Floor finishes						68.12		
C3	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2			314.89		As building
C3	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2			0		20
C3	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2			0.046		As building
C3	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2			0.78		30
C3	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2			0		10
C3	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2			468.45		30
C3	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2			26472.93		As building
C3	3.2.Floor finishes						27257.09		
C4	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2			0.37		20
C4	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2			0.059		10
C4	3.2.Floor finishes						0.43		
D	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2			-218.32		As building
D	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2			-2.33		As building
D	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2			-18.6		30
D	3.2.Floor finishes	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1226	m2			-712.49		30
D	3.2.Floor finishes	Massive wooden flooring/parquet, 22-450 x 44-7000 x 8-35 mm, 11.71 kg/m2 (Ver	1226	m2			-11316.42		As building
D	3.2.Floor finishes								
TOTAL	3.2.Floor finishes	Permanent non-load-bearing shuttering and insulation system from EPS blocks fo	42	m2			1047.45		As building
TOTAL	3.2.Floor finishes	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)	94	m2			364.02		20
TOTAL	3.2.Floor finishes	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m3, Verlegemörtel (PCI A	94	m2			68.82		As building
TOTAL	3.2.Floor finishes	Ceramic wall tiles, 7.5 mm, 3000 kg/m2 (Seranit Granit Seramik)	94	m2			3142.16		30
TOTAL	3.2.Floor finishes	Acrylic paint for concrete floors, 1.2 kg/l, 37% solids/volume, 8-10 m2/L, TRESTJE	474	m2			401.78		10

D	5.11.Fire and lightning protection	Smoke detector, French average, Détecteurs de fumée (DONNEE ENVIRONNEM	106.43	unit	-317.82	20
D	5.11.Fire and lightning protection	PVC resin pipes, for sewerage, drainage and conduits application, 16 - 315 mm, 1	229.38	kg	-1392.7	20
D	5.11.Fire and lightning protection	Galvanized steel edging, 2.5 mm, H = 120 mm, 2.34 kg/m, Bordure en acier galva	1009.25	m	-10803.67	30
D	5.11.Fire and lightning protection					
TOTAL	5.11.Fire and lightning protection	Power supply, 0.04 kg/unit, SecurITRON AOD6 Series Power Supplies (Assa Ablou)	1.84	unit	182.17	20
TOTAL	5.11.Fire and lightning protection	Multimedia box with telephone, TV and LAN outputs, 1.485 kg/unit, RJ45 413218	1.84	unit	41.26	20
TOTAL	5.11.Fire and lightning protection	Metallic electrical equipment box/cabinet, 904421N (LEGRAND)	1.84	unit	193.67	20
TOTAL	5.11.Fire and lightning protection	Electrical control panel, IB+ Touch Building Controller (SOMFY)	1.84	unit	576.41	20
TOTAL	5.11.Fire and lightning protection	Audible signaling device (siren), Matériel de signalisation phonique (sirène) (DON	3.67	unit	329.7	20
TOTAL	5.11.Fire and lightning protection	Output module, flush mounted, 0.123 kg/unit, TXB692F TYB692F; TYB602F; TYB	9.18	unit	20.52	20
TOTAL	5.11.Fire and lightning protection	Autonomous fire alarm system, BAASL Sa (1 405 31) (Legrand)	9.18	unit	206.01	20
TOTAL	5.11.Fire and lightning protection	Indicator light push button, 0.0505 kg/unit, A9E18037 0 (SCHNEIDER ELECTRIC	18.35	unit	19.86	20
TOTAL	5.11.Fire and lightning protection	Electromagnetic door holders and releasers, 0.8672 kg/unit, Rixson 99X Series EI	18.35	unit	253.8	20
TOTAL	5.11.Fire and lightning protection	Copper data cable, plenum rated, 0.0454 kg/m, 10Gain XP 6A (Superior Essex)	91.75	m	96.69	20
TOTAL	5.11.Fire and lightning protection	Smoke detector, French average, Détecteurs de fumée (DONNEE ENVIRONNEM	106.43	unit	1472.23	20
TOTAL	5.11.Fire and lightning protection	PVC resin pipes, for sewerage, drainage and conduits application, 16 - 315 mm, 1	229.38	kg	2633.96	20
TOTAL	5.11.Fire and lightning protection	Galvanized steel edging, 2.5 mm, H = 120 mm, 2.34 kg/m, Bordure en acier galva	1009.25	m	20871.33	30
TOTAL	5.11.Fire and lightning protection	Communication cable, 0.231 kg/m, Câble PTT 288 (14 paires) - DONNEE ENVI	1449.65	m	4369.16	20
TOTAL	5.11.Fire and lightning protection					
TOTAL	5.11.Fire and lightning protection	Power supply, 0.04 kg/unit, SecurITRON AOD6 Series Power Supplies (Assa Ablou)	1.84	unit	0	20
TOTAL	5.11.Fire and lightning protection	Multimedia box with telephone, TV and LAN outputs, 1.485 kg/unit, RJ45 413218	1.84	unit	0	20
TOTAL	5.11.Fire and lightning protection	Metallic electrical equipment box/cabinet, 904421N (LEGRAND)	1.84	unit	0	20
TOTAL	5.11.Fire and lightning protection	Electrical control panel, IB+ Touch Building Controller (SOMFY)	1.84	unit	0	20
TOTAL	5.11.Fire and lightning protection	Audible signaling device (siren), Matériel de signalisation phonique (sirène) (DON	3.67	unit	0	20
TOTAL	5.11.Fire and lightning protection	Output module, flush mounted, 0.123 kg/unit, TXB692F TYB692F; TYB602F; TYB	9.18	unit	0	20
TOTAL	5.11.Fire and lightning protection	Autonomous fire alarm system, BAASL Sa (1 405 31) (Legrand)	9.18	unit	0	20
TOTAL	5.11.Fire and lightning protection	Indicator light push button, 0.0505 kg/unit, A9E18037 0 (SCHNEIDER ELECTRIC	18.35	unit	0	20
TOTAL	5.11.Fire and lightning protection	Electromagnetic door holders and releasers, 0.8672 kg/unit, Rixson 99X Series EI	18.35	unit	0	20
TOTAL	5.11.Fire and lightning protection	Copper data cable, plenum rated, 0.0454 kg/m, 10Gain XP 6A (Superior Essex)	91.75	m	0	20
TOTAL	5.11.Fire and lightning protection	Smoke detector, French average, Détecteurs de fumée (DONNEE ENVIRONNEM	106.43	unit	0	20
TOTAL	5.11.Fire and lightning protection	PVC resin pipes, for sewerage, drainage and conduits application, 16 - 315 mm, 1	229.38	kg	0	20
TOTAL	5.11.Fire and lightning protection	Galvanized steel edging, 2.5 mm, H = 120 mm, 2.34 kg/m, Bordure en acier galva	1009.25	m	0	30
TOTAL	5.11.Fire and lightning protection	Communication cable, 0.231 kg/m, Câble PTT 288 (14 paires) - DONNEE ENVI	1449.65	m	0	20
TOTAL	5.11.Fire and lightning protection					
TOTAL	5.11.Fire and lightning protection			3231.19	33536.78	
A1-A3	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	39.62	30
A1-A3	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	115.94	485.23
A1-A3	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	183.39	580.82
A1-A3	5.12.Communication, Security and Control Systems			338.94	1268.89	
A4	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	0.37	30
A4	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	1.08	30
A4	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	1.7	30
A4	5.12.Communication, Security and Control Systems				3.14	
A5	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	0.4	2.03
A5	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	1.16	4.87
A5	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	1.83	5.84
A5	5.12.Communication, Security and Control Systems			3.39	12.74	
B3	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	0	30
B3	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	0	30
B3	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	0	30
B3	5.12.Communication, Security and Control Systems					
B4	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	203.43	30
B4	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	486.94	30
B4	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	583.54	30
B4	5.12.Communication, Security and Control Systems				1273.91	
B5	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	0	30
B5	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	0	30
B5	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	0	30
B5	5.12.Communication, Security and Control Systems					
C2	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	0.12	30
C2	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	0.34	30
C2	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	0.54	30
C2	5.12.Communication, Security and Control Systems				0.99	
C3	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	0	30
C3	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	0	30
C3	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	0	30
C3	5.12.Communication, Security and Control Systems					
C4	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	0	30
C4	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	0.3	30
C4	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	0.48	30
C4	5.12.Communication, Security and Control Systems				0.88	
TOTAL	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	408.89	30
TOTAL	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	978.75	30
TOTAL	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	1172.31	30
TOTAL	5.12.Communication, Security and Control Systems					
TOTAL	5.12.Communication, Security and Control Systems	Communication cable, 53.4g/m, Cable BUS.500m,B2cas1d1a1.vert (TGZ185) Ca	729.41	m	0	30
TOTAL	5.12.Communication, Security and Control Systems	Coaxial cable (TV / FM), Diam. 10 mm, Câble coaxial (TV / FM) (DONNEE ENVI	917.5	m	0	30
TOTAL	5.12.Communication, Security and Control Systems	Communication cable, ethernet, Grade 2 TV R7800 Famille environnementale hor	3486.5	m	0	30
TOTAL	5.12.Communication, Security and Control Systems					
TOTAL	5.12.Communication, Security and Control Systems			342.33	2560.56	
A1-A3	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	27.47	30
A1-A3	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047	kg	240.06	629.79
A1-A3	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310	m2	4495	79980
A1-A3	5.13.Special installations			4762.52	80661.83	
A4	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	0	30
A4	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047	kg	1.01	30
A4	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310	m2	41.69	20
A4	5.13.Special installations				42.96	
A5	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	0	30
A5	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047	kg	18	48.04
A5	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310	m2	0	20
A5	5.13.Special installations			18	48.04	
B3	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	0	30
B3	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047	kg	0	30
B3	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310	m2	0	20
B3	5.13.Special installations					
B4	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	53.45	30
B4	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047	kg	640.51	30
B4	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310	m2	160420.89	20
B4	5.13.Special installations				161114.86	
B5	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	0	30
B5	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047	kg	0	30
B5	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310	m2	0	20
B5	5.13.Special installations					
C2	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	1.05	30
C2	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047	kg	9.19	30
C2	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310	m2	172.13	20
C2	5.13.Special installations				182.37	
C3	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	0.094	30
C3	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047	kg	0.52	30
C3	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310	m2	15.46	20
C3	5.13.Special installations				16.08	
C4	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	0.0071	30
C4	5.13.Special installations	Photovoltaic monocrystalline panel, per m2, 14.5 kg/m2, 224 Wp (One Click LCA)	310	m2	1.17	20
C4	5.13.Special installations				1.18	
D	5.13.Special installations	Flush metal enclosure with door, 23.1 kg/unit, 401449 + 401459 Ref door : 40144	1.1892	unit	-109.01	30
D	5.13.Special installations	Steel sheet hot dip galvanized, 2-20 mm, 7840 kg/m3	240.047	kg	-1098.13	30

bioC	5.4. Water installations				2010.27	8962.83		
A1-A3	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	45	198.43	45
A1-A3	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	45	198.43	45
A1-A3	5.5. Heat source	Stainless steel sheet, 7900.0 kg/m ²		120	kg	120	403.78	As building
A1-A3	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	8588.55	18021.47	35
A1-A3	5.5. Heat source					8798.55	18822.1	
A4	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	0.42	45
A4	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	0.42	45
A4	5.5. Heat source	Stainless steel sheet, 7900.0 kg/m ²		120	kg	0	0.51	As building
A4	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	79.66	35
A4	5.5. Heat source					0	81	
A5	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0.45	2.01	45
A5	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0.45	2.01	45
A5	5.5. Heat source	Stainless steel sheet, 7900.0 kg/m ²		120	kg	3	10.23	As building
A5	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	0	35
A5	5.5. Heat source					3.9	14.24	
B3	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	0	45
B3	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	0	45
B3	5.5. Heat source	Stainless steel sheet, 7900.0 kg/m ²		120	kg	0	0	As building
B3	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	0	35
B3	5.5. Heat source					0	0	
B4	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	200.73	45
B4	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	200.73	45
B4	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	18148.6	35
B4	5.5. Heat source					0	18550.06	
B5	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	0	45
B5	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	0	45
B5	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	0	35
B5	5.5. Heat source					0	0	
C2	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	1.72	1.72	45
C2	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	4.6	4.6	As building
C2	5.5. Heat source	Stainless steel sheet, 7900.0 kg/m ²		120	kg	0	25.13	35
C2	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	33.17	35
C2	5.5. Heat source					0	53.17	
C3	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0.15	0.15	45
C3	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0.15	0.15	45
C3	5.5. Heat source	Stainless steel sheet, 7900.0 kg/m ²		120	kg	0.25	0.25	As building
C3	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	0	35
C3	5.5. Heat source					0	0.56	
C4	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0.012	0.012	45
C4	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0.012	0.012	45
C4	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	22.33	35
C4	5.5. Heat source					0	22.35	
D	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	-179.47	45
D	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	-179.47	45
D	5.5. Heat source	Stainless steel sheet, 7900.0 kg/m ²		120	kg	0	-618.62	As building
D	5.5. Heat source					0	0	
TOTAL	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	403.48	45
TOTAL	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	403.48	45
TOTAL	5.5. Heat source	Stainless steel sheet, 7900.0 kg/m ²		120	kg	0	419.36	As building
TOTAL	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	36297.19	35
TOTAL	5.5. Heat source					0	0	
bioC	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	0	45
bioC	5.5. Heat source	Circulating pump, 250-1000W/unit		1.5	unit	0	0	45
bioC	5.5. Heat source	Stainless steel sheet, 7900.0 kg/m ²		120	kg	0	0	As building
bioC	5.5. Heat source	Sewer pipe PE-HD		8588.55	kg	0	0	35
bioC	5.5. Heat source					0	0	
A1-A3	5.6. Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5		1	unit	1255.55	10176.32	25
A1-A3	5.6. Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL		4.59	unit	660.96	4773.6	30
A1-A3	5.6. Space heating and Airconditioning	Electric heat pump (air-water), 10 kW		4.59	unit	1317.33	2106.77	30
A1-A3	5.6. Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine		32.113	unit	22.48	204.08	30
A1-A3	5.6. Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)		36.7	unit	14.68	113.54	30
A1-A3	5.6. Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou		41.29	unit	247.74	1170.67	30
A1-A3	5.6. Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc		41.29	unit	7.93	642.16	30
A1-A3	5.6. Space heating and Airconditioning	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en la		82.58	unit	24.77	237.53	30
A1-A3	5.6. Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608		114.69	unit	53.79	796.97	30
A1-A3	5.6. Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a		321.13	m	545.92	5523.44	30
A1-A3	5.6. Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)		603.72	m	513.16	3732.03	60
A1-A3	5.6. Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/		1146.88	m	29.59	72.13	30
A1-A3	5.6. Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)		1564.34	kg	1564.34	3848.28	30
A1-A3	5.6. Space heating and Airconditioning					6288.25	33397.5	
A4	5.6. Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5		1	unit	1256	111.65	25
A4	5.6. Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL		4.59	unit	6.11	6.13	30
A4	5.6. Space heating and Airconditioning	Electric heat pump (air-water), 10 kW		4.59	unit	12.22	12.22	30
A4	5.6. Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine		32.113	unit	0.21	0.21	30
A4	5.6. Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)		36.7	unit	0.14	0.14	30
A4	5.6. Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou		41.29	unit	2.3	2.3	30
A4	5.6. Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc		41.29	unit	0.074	0.074	30
A4	5.6. Space heating and Airconditioning	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en la		82.58	unit	0.25	0.25	30
A4	5.6. Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608		114.69	unit	0.5	0.5	30
A4	5.6. Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a		321.13	m	5.06	5.06	30
A4	5.6. Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)		603.72	m	4.76	4.76	60
A4	5.6. Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/		1146.88	m	0.091	0.091	30
A4	5.6. Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)		1564.34	kg	15.96	15.96	30
A4	5.6. Space heating and Airconditioning					59.34	59.34	
A5	5.6. Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5		1	unit	1256	102.41	25
A5	5.6. Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL		4.59	unit	6.61	48.07	30
A5	5.6. Space heating and Airconditioning	Electric heat pump (air-water), 10 kW		4.59	unit	13.17	21.74	30
A5	5.6. Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine		32.113	unit	0	0	30
A5	5.6. Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)		36.7	unit	0	0	30
A5	5.6. Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou		41.29	unit	0	0	30
A5	5.6. Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc		41.29	unit	0.079	6.43	30
A5	5.6. Space heating and Airconditioning	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en la		82.58	unit	1.49	14.33	30
A5	5.6. Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608		114.69	unit	0.54	8	30
A5	5.6. Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a		321.13	m	0	0	30
A5	5.6. Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)		603.72	m	5.13	37.58	60
A5	5.6. Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/		1146.88	m	2.22	10.01	30
A5	5.6. Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)		1564.34	kg	93.86	235.8	30
A5	5.6. Space heating and Airconditioning					135.65	484.36	
B3	5.6. Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5		1	unit	1256	0	25
B3	5.6. Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL		4.59	unit	0	0	30
B3	5.6. Space heating and Airconditioning	Electric heat pump (air-water), 10 kW		4.59	unit	0	0	30
B3	5.6. Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine		32.113	unit	0	0	30
B3	5.6. Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)		36.7	unit	0	0	30
B3	5.6. Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou		41.29	unit	0	0	30
B3	5.6. Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc		41.29	unit	0	0	30
B3	5.6. Space heating and Airconditioning	Brass quarter-turn valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en la		82.58	unit	0	0	30
B3	5.6. Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608		114.69	unit	0	0	30
B3	5.6. Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a		321.13	m	0	0	30
B3	5.6. Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)		603.72	m	0	0	60
B3	5.6. Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/		1146.88	m	0	0	30
B3	5.6. Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)		1564.34	kg	0	0	30
B3	5.6. Space heating and Airconditioning					0	0	
B4	5.6. Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5		1	unit	1256	20481.37	25
B4	5.6. Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL		4.59	unit	4809.49	4809.49	30

B4	5.6.Space heating and Airconditioning	Electric heat pump (air-water), 10 kW	4.59	unit		2174.3	30
B4	5.6.Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine)	32.113	unit		204.41	30
B4	5.6.Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)	36.7	unit		113.76	30
B4	5.6.Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou	41.29	unit		1183.37	30
B4	5.6.Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc	41.29	unit		642.57	30
B4	5.6.Space heating and Airconditioning	Brass quarter-lum valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	82.58	unit		238.82	30
B4	5.6.Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608	114.69	unit		799.73	30
B4	5.6.Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a	321.13	m		5531.52	30
B4	5.6.Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/m	1146.88	m		133.44	30
B4	5.6.Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)	1564.34	kg		3929.93	30
B4	5.6.Space heating and Airconditioning					40240.71	
B5	5.6.Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5	1	unit	0	0	25
B5	5.6.Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL	4.59	unit	0	0	30
B5	5.6.Space heating and Airconditioning	Electric heat pump (air-water), 10 kW	4.59	unit	0	0	30
B5	5.6.Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine)	32.113	unit	0	0	30
B5	5.6.Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)	36.7	unit	0	0	30
B5	5.6.Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou	41.29	unit	0	0	30
B5	5.6.Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc	41.29	unit	0	0	30
B5	5.6.Space heating and Airconditioning	Brass quarter-lum valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	82.58	unit	0	0	30
B5	5.6.Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608	114.69	unit	0	0	30
B5	5.6.Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a	321.13	m	0	0	30
B5	5.6.Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/m	1146.88	m	0	0	30
B5	5.6.Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)	1564.34	kg	0	0	30
B5	5.6.Space heating and Airconditioning						
C2	5.6.Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5	1	unit		45.08	25
C2	5.6.Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL	4.59	unit		25.31	30
C2	5.6.Space heating and Airconditioning	Electric heat pump (air-water), 10 kW	4.59	unit		50.44	30
C2	5.6.Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine)	32.113	unit		0.066	30
C2	5.6.Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)	36.7	unit		0.043	30
C2	5.6.Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou	41.29	unit		9.49	30
C2	5.6.Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc	41.29	unit		0.3	30
C2	5.6.Space heating and Airconditioning	Brass quarter-lum valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	82.58	unit		0.05	30
C2	5.6.Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608	114.69	unit		2.06	30
C2	5.6.Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a	321.13	m		1.6	30
C2	5.6.Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)	603.72	m		19.65	60
C2	5.6.Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/m	1146.88	m		0.11	30
C2	5.6.Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)	1564.34	kg		59.9	30
C2	5.6.Space heating and Airconditioning					218	
C3	5.6.Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5	1	unit		4.32	25
C3	5.6.Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL	4.59	unit		2.27	30
C3	5.6.Space heating and Airconditioning	Electric heat pump (air-water), 10 kW	4.59	unit		4.53	30
C3	5.6.Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine)	32.113	unit		0	30
C3	5.6.Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)	36.7	unit		0	30
C3	5.6.Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou	41.29	unit		0.85	30
C3	5.6.Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc	41.29	unit		0.027	30
C3	5.6.Space heating and Airconditioning	Brass quarter-lum valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	82.58	unit		0.085	30
C3	5.6.Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608	114.69	unit		0.18	30
C3	5.6.Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a	321.13	m		0	30
C3	5.6.Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)	603.72	m		1.76	60
C3	5.6.Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/m	1146.88	m		61.11	30
C3	5.6.Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)	1564.34	kg		5.38	30
C3	5.6.Space heating and Airconditioning					80.53	
C4	5.6.Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5	1	unit		0.33	25
C4	5.6.Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL	4.59	unit		0.17	30
C4	5.6.Space heating and Airconditioning	Electric heat pump (air-water), 10 kW	4.59	unit		0.34	30
C4	5.6.Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine)	32.113	unit		0.058	30
C4	5.6.Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)	36.7	unit		0.038	30
C4	5.6.Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou	41.29	unit		0.064	30
C4	5.6.Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc	41.29	unit		0.0021	30
C4	5.6.Space heating and Airconditioning	Brass quarter-lum valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	82.58	unit		0.0064	30
C4	5.6.Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608	114.69	unit		0.014	30
C4	5.6.Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a	321.13	m		1.42	30
C4	5.6.Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)	603.72	m		0.13	60
C4	5.6.Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)	1564.34	kg		0.41	30
C4	5.6.Space heating and Airconditioning					2.98	
D	5.6.Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5	1	unit		-7498.63	25
D	5.6.Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL	4.59	unit		-2636.04	30
D	5.6.Space heating and Airconditioning	Electric heat pump (air-water), 10 kW	4.59	unit		-5253.78	30
D	5.6.Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine)	32.113	unit		-983.12	30
D	5.6.Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)	36.7	unit		-31.63	30
D	5.6.Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou	41.29	unit		-101.26	30
D	5.6.Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc	41.29	unit		-21.52	30
D	5.6.Space heating and Airconditioning	Brass quarter-lum valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	82.58	unit		-1028.39	60
D	5.6.Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608	114.69	unit		-79.3	30
D	5.6.Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)	603.72	m		-6363.73	30
D	5.6.Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/m	1146.88	m			
D	5.6.Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)	1564.34	kg			
D	5.6.Space heating and Airconditioning						
TOTAL	5.6.Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5	1	unit		30824.47	25
TOTAL	5.6.Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL	4.59	unit		9663.05	30
TOTAL	5.6.Space heating and Airconditioning	Electric heat pump (air-water), 10 kW	4.59	unit		4370.35	30
TOTAL	5.6.Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine)	32.113	unit		408.82	30
TOTAL	5.6.Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)	36.7	unit		227.51	30
TOTAL	5.6.Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou	41.29	unit		2366.73	30
TOTAL	5.6.Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc	41.29	unit		129.56	30
TOTAL	5.6.Space heating and Airconditioning	Brass quarter-lum valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	82.58	unit		491.97	30
TOTAL	5.6.Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608	114.69	unit		1607.45	30
TOTAL	5.6.Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a	321.13	m		11063.03	30
TOTAL	5.6.Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)	603.72	m		3795.92	60
TOTAL	5.6.Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/m	1146.88	m		276.9	30
TOTAL	5.6.Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)	1564.34	kg		8095.65	30
TOTAL	5.6.Space heating and Airconditioning						
bioC	5.6.Space heating and Airconditioning	Air handling unit, with heat recovery through plate heat exchanger, 10 000 m3/h (5	1	unit		0	25
bioC	5.6.Space heating and Airconditioning	Floor gas boiler, P=25KW, Chaudière gaz au sol (DONNEE ENVIRONNEMENTAL	4.59	unit		0	30
bioC	5.6.Space heating and Airconditioning	Electric heat pump (air-water), 10 kW	4.59	unit		0	30
bioC	5.6.Space heating and Airconditioning	4-port water brass manifolds, 0.7 kg/unit, Collecteur (=nourrice=répartiteur=clarine)	32.113	unit		0	30
bioC	5.6.Space heating and Airconditioning	Thermostatic radiator valve (MDEGD)	36.7	unit		0	30
bioC	5.6.Space heating and Airconditioning	Steel box for home heating manifold, 6kg, Coffret en acier pour collecteur (ou nou	41.29	unit		0	30
bioC	5.6.Space heating and Airconditioning	Programmable thermostat, 0.1921 kg/unit, 6053005 TYBOX 1117 Autres référenc	41.29	unit		0	30
bioC	5.6.Space heating and Airconditioning	Brass quarter-lum valve, 0.3 kg/unit, diameter: 20 mm, Vanne quart-de-tour en laï	82.58	unit		0	30
bioC	5.6.Space heating and Airconditioning	Output module, 0.469 kg/unit, TYA608C TYA608D; TYA608B; TYA608A; TXA608	114.69	unit		0	30
bioC	5.6.Space heating and Airconditioning	Copper pipe drainage and sewage network, 1.7 kg/m, Réseau d'évacuation et d'a	321.13	m		0	30
bioC	5.6.Space heating and Airconditioning	Ventilation ducting, per m linear, D: 63 mm (2.48 in)	603.72	m		0	60
bioC	5.6.Space heating and Airconditioning	Single-sided adhesive tape with reinforcement grid and protective film, 0.0258 kg/m	1146.88	m		0	30
bioC	5.6.Space heating and Airconditioning	PEX pipes for underfloor heating systems, Klett Pipe (Uponor Corporation)	1564.34	kg		0	30
bioC	5.6.Space heating and Airconditioning						
A1-A3	5.7.Ventilation systems					6393.9	74483.43
A1-A3	5.8.Electrical installations	Insulated switchgear, 422.165 kg/unit, SM6-36 IM (SCHNEIDER ELECTRIC INDL	39.96	kg		39.96	As building
A1-A3	5.8.Electrical installations	Junction box, 0.154 kg/unit, IP55 100x100 (B05534), B05534, B05546 (Hager SE	51.96	kg		61.59	As building
A1-A3	5.8.Electrical installations	Cable 1-wire, 0.02 kg/m	259.209	kg		259.21	As building
A1-A3	5.8.Electrical installations	Communication cable, 0.231 kg/m, Câble PTT 288 (14 paires) - DONNEE ENVR	453.398	kg		453.4	As building
A1-A3	5.8.Electrical installations	Energy Efficient EX Transformers (Copper), EX75T3H, DOE 2016 (SCHNEIDER	536.294	kg		536.29	As building
A1-A3	5.8.Electrical installations	Battery Lithium ion, French average, capacité=200Ah, Batterie Lithium ion (DONN	638.445	kg		638.45	As building
A1-A3	5.8.Electrical installations	Fluorescent lamp, T8-18W, 0.07 kg/unit	1001.08	kg		1001.08	As building
A1-A3	5.8.Electrical installations	Power cable, ≥16mm², 1.73 kg/m, ALSECURE® Monoconductor (S≥16mm²) (Next	1367.075	m		2371.4	30
A1-A3	5.8.Electrical installations	Cable 5-wire, 0.168 kg/m	1504.7	m		252.79	30
A1-A3	5.8.Electrical installations	Corrugated plastic pipes, 0.138 kg/m, FFKuS-EM-F-105 cot2nrol (Fränkische Roh	2078.14	m		286.78	30
A1-A3	5.8.Electrical installations	Cable 3-wire, 0.121 kg/m	8638.26	m		1045.23	30
A1-A3	5.8.Electrical installations					6936.17	28333.17

B6b	5.Services	Electricity, United Kingdom, SAP 10.1 and 10.2	15900	kWh	129744
B7	5.Services	Tap water, clean - Thames Water Utilities Ltd	350	m3	411.6
B7	5.Services	Wastewater - Thames Water Utilities Ltd	350	m3	2349.9
B7	5.Services				2761.5
TOTAL	5.Services	Tap water, clean - Thames Water Utilities Ltd	350	m3	411.6
TOTAL	5.Services	Wastewater - Thames Water Utilities Ltd	350	m3	2349.9
TOTAL	5.Services	Electricity, United Kingdom, SAP 10.1 and 10.2	5543	kWh	45230.88
TOTAL	5.Services	Electricity, United Kingdom, SAP 10.1 and 10.2	15900	kWh	129744
TOTAL	5.Services				177736.38
A5	Other site construction or overall construction stage	Average construction site impacts, scenario for temperate and southern climate, E	1835	m2	25524.85
TOTAL	Other site construction or overall construction stage	Average construction site impacts, scenario for temperate and southern climate, E	1835	m2	25524.85
	Other site construction or overall construction stage				25524.85