

Francis Gardner House: Life Cycle Analysis (LCA)

Introduction:

Life Cycle Analysis (LCA) is a method of determining the total environmental impact of a product during its entire lifecycle, from cradle to grave. In the building life cycle, embodied carbon is the carbon dioxide equivalent (CO₂e) or greenhouse gas emissions associated with the non-operational phase of the project.

For buildings, it is becoming increasingly important to consider the impact of embodied carbon. This is because modern buildings typically benefit from efficient building services and renewable technologies to achieve low operational CO₂ emissions, but often do not consider the significant impact caused by embodied carbon, which are the emissions associated with the extraction of raw materials, production, transport, construction, maintenance, use, demolition and waste disposal.

This report applies the LCA methodology using the OneClickLCA assessment tool and BRE dataset to Francis Gardner House, in order to measure the environmental impact of the superstructure and provide recommendations for reducing its environmental impact.

Proposed Development:

Name:	Francis Gardner House
Building Type:	Student Accommodation
Location:	Camden, London
Gross Floor Area:	3584.0 m ²
External Wall Type:	Brick Cladding on framed construction
Window Type:	Aluminium framed windows
Floor Slab Type:	Composite deck upper floors

Results – Embodied Carbon:



Carbon Savings from New Construction:

The embodied carbon associated with the construction of the new building is calculated to be 677 tonnes CO₂ total.

The above figure is the sum of LCA categories A1-A3 construction materials, A4 transportation to site, B4-B5 material replacement and refurbishment, and C1-C4 end of life.

For purposes of comparison to a refurbishment project, the embodied carbon associated with categories B4-B5 and C1-C4 should be omitted, as maintenance, refurbishment, and end of life apply to both buildings.

The embodied carbon for refurbishing the building associated with categories A1-A4 is approximately 15% of that of a new construction. This is based on installation of insulation to bring the building in line with Part L2B, replacement windows, and additional materials such as plasterboard required for remodelling and updating the building.

The new construction would therefore need to 'pay back' 540.8 tonnes of embodied CO₂ over its lifetime in order to be viable. As per the Energy Strategy Addendum issued 26/11/2020, the proposed building shall save 38.2 tonnes per annum in operational CO₂ emissions compared to a refurbishment option. The construction of the proposed building shall therefore be carbon neutral within 14.2 years of construction.

As per the comparison below, the proposals shall achieve **1,749.4 tonnes total CO₂ savings** over the 60-year life span of the building compared to a refurbishment.

	New Construction (tonnes CO ₂)	Refurbishment (tonnes CO ₂)
A1-A3 Construction Materials	626.2	93.9
A4 Transportation to site	10.0	1.5
B4-B5 Replacement & refurbishment	19.8	19.8
C1-C4 End of life	20.9	20.9
Operational Carbon (over 60 years)	4234.8	6525.0
Total Carbon Emissions	4911.7	6661.1

Life-Cycle Assessment Results

The full Life Cycle Analysis results in accordance with EN 15978 and BREEAM UK New Construction 2018 are presented below. Further charts confirming the breakdown of embodied carbon are included on the following pages.

	Result category	Global warming kg CO ₂ e	Acidification kg SO ₂ e	Eutrophication kg PO ₄ e	Ozone depletion potential kg CFC11e	Formation of ozone of lower atmosphere kg Ethenee	Non-hazardous waste disposed kg	Biogenic carbon storage kg CO ₂ e bio
A1-A3	Construction Materials	626,161.43	1,978.65	244.28	0.02	180.38	24,714.25	12,239.58
A4	Transportation to site	10,023.51	26.7	5.69	0	1.14	46.91	
B4-B5	Material replacement and refurbishment	19,842.38	150.71	16.55	0	7.88	392.3	
C1-C4	End of life	20,881.31	76.46	22.21	0	5.13	205,931.52	
	Total	676,908.63	2,232.52	288.73	0.03	194.53	231,084.99	12,239.58
	Results per denominator							
	Gross Internal Floor Area (IPMS/RICS) 3584.0 m ²	188.87	0.62	0.08	0	0.05	64.48	3.42

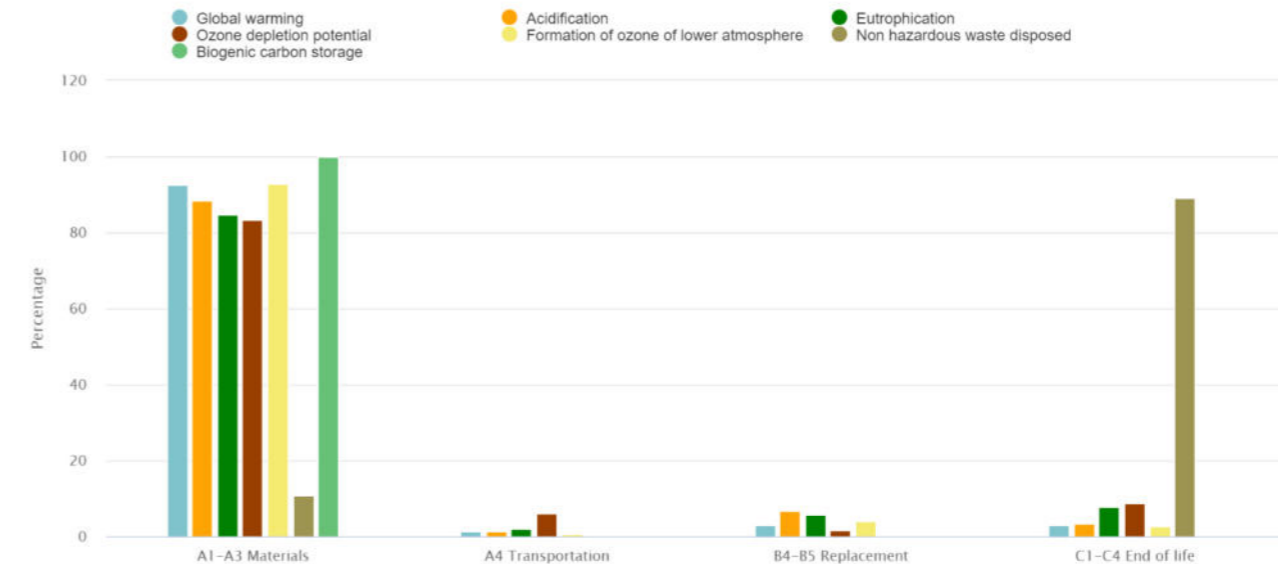
Results by Life Cycle Stage

This assessment covered full life cycle according to the categories defined in BS EN 15978:2011, as follows:

- A1-A3 Construction Materials
- A4 Transport
- B1-B5 Use, Maintenance, Replacements & Refurbishment
- C1-C4 End of Life

Life Cycle Analysis confirmed that the most significant life cycle impact for this development relates to category A1-A3 Construction Materials, which represented 92.5% of the Global Warming Potential (GWP).

Results by life-cycle stage



Global Warming Potential (GWP) by Resource

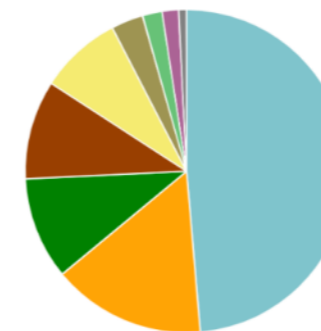
The material with the largest environmental impact was found to be concrete, followed by metals (including steel reinforcement), insulation, plasterboard, and brick. The significant impact of concrete and steel reinforcement corresponds directly to the new concrete floor and roof slabs, which is the most impactful element.

In the case of a refurbishment, embodied carbon would be generated by new insulation installed to bring the building in line with Part L2B, replacement windows, and additional materials such as plasterboard required for remodelling and updating the building. As per the chart provided, insulation is responsible for 10% of the proposed building's embodied carbon, glazing responsible for 2%, and gypsum plaster and cement 9.9%.

Global warming kg CO2e - Resource types

This is a drilldown chart. Click on the chart to view details

- Concrete - 48.7%
- Metals - 15.4%
- Insulation - 10.2%
- Gypsum, plaster & cement - 9.9%
- Bricks and ceramics - 8.2%
- Plastics, membranes & roofing - 3.2%
- Glass - 2.0%
- Coatings & pastes - 1.7%
- Wood - 0.8%



Appendix: LCA Detail Report

		43120	110.96	16.62	0.0024	7.8	1138.3	203910												
A1-A3	Glue laminated timber, 500.33 kg/m3, 10.61% moisture content, Duobalken, Triobalken (Konstruktionsvollholz e.V.)	0	m3	0	0	0	0	0	0	0	0	0	2.1.5.Timber frames	190 mm x 360 mm (GL30c)	As building	Timber column - for timber frame buildings	CLT, glulam and LVL	Duobalken, Triobalken (glued solid timber) Studiengemeinschaft Holzeimbau e.V. and Überwachungsgemeinschaft Konstruktionsvollholz e.V.	P5	
A1-A3	Glue laminated timber, 500.33 kg/m3, 10.61% moisture content, Duobalken, Triobalken (Konstruktionsvollholz e.V.)	0	m3	0	0	0	0	0	0	0	0	0	2.1.5.Timber frames	190 mm x 360 mm (GL30c)	As building	Timber column - for timber frame buildings	CLT, glulam and LVL	Duobalken, Triobalken (glued solid timber) Studiengemeinschaft Holzeimbau e.V. and Überwachungsgemeinschaft Konstruktionsvollholz e.V.	P5	
A1-A3												2.1.5.Timber frames	190 mm x 360 mm (GL30c)							
A1-A3	Composite steel deck floors, C25/30, concrete: 120 - 408 kg/m2, steel reinforcement: 1.5 - 26 kg/m2, steel decking: 9.47 kg/m2, • AMCF ArcelorMittal Construction France ds.arcelormittal.com/construction/France o COFRAPLUS 60 o COFRAPLUS 77 o COFRAPLUS 80 o COFRAPLUS 220 o COFRASTRA 40 o COFRASTRA 56 o COFRASTRA 70 • Bacacier www.bacacier.com o PCB 20 o PCB 60 o PCB 80 • JORIS IDE www.joriside.be o PML 60 PC o PML 60 PC PP • Tata Steel France Batiments et systèmes – Monopanel www.monopanel.fr o HI-BOND 55.750 o HI-BOND 55.750 C o HI-BOND 55.800 o HI-BOND 55.800 C o HI-BOND 77.570 (L'ENVELOPPE METALLIQUE DU BATIMENT)	3090.9	m2	199981	585.28	68.05	0.012	74.88	2419.1	0	957159		2.2.1.Floors		As building		Concrete slabs (hollow and solid)	FDES		P2
A1-A3	Floor screed mortar, cement screed, 1500 kg/m3, EPD coverage: > 1500 kg/m3 (quick-mix Gruppe GmbH & Co. KG)	3090.9	m2	28304	33.27	6.55	4E-06	2.05	105.15	0	185454		2.2.1.Floors		As building		Leveling screeds (for floors)	Oekobau.dat 2017-I, EPD Mineralische Werkmörtel: Estrichmörtel - Zementestrich quick-mix Gruppe GmbH & Co. KG	P2	
A1-A3		228285	618.55	74.6	0.012	76.93	2524.3	1E+06					2.2.1.Floors							
A4	Composite steel deck floors, C25/30, concrete: 120 - 408 kg/m2, steel reinforcement: 1.5 - 26 kg/m2, steel decking: 9.47 kg/m2, • AMCF ArcelorMittal Construction France ds.arcelormittal.com/construction/France o COFRAPLUS 60 o COFRAPLUS 77 o COFRAPLUS 80 o COFRAPLUS 220 o COFRASTRA 40 o COFRASTRA 56 o COFRASTRA 70 • Bacacier www.bacacier.com o PCB 20 o PCB 60 o PCB 80 • JORIS IDE www.joriside.be o PML 60 PC o PML 60 PC PP • Tata Steel France Batiments et systèmes – Monopanel www.monopanel.fr o HI-BOND 55.750 o HI-BOND 55.750 C o HI-BOND 55.800 o HI-BOND 55.800 C o HI-BOND 77.570 (L'ENVELOPPE METALLIQUE DU BATIMENT)	3090.9	m2	2199.1	10.13	2.21	0.0004	0.12	6.7				2.2.1.Floors		As building		Concrete slabs (hollow and solid)	FDES	Trailer combination, 40 ton capacity, 100% fill rate	P2
A4	Floor screed mortar, cement screed, 1500 kg/m3, EPD coverage: > 1500 kg/m3 (quick-mix Gruppe GmbH & Co. KG)	3090.9	m2	426.09	1.96	0.43	8E-05	0.024	1.3				2.2.1.Floors		As building		Leveling screeds (for floors)	Oekobau.dat 2017-I, EPD Mineralische Werkmörtel: Estrichmörtel - Zementestrich quick-mix Gruppe GmbH & Co. KG	Trailer combination, 40 ton capacity, 100% fill rate	P2
A4		2625.2	12.09	2.63	0.0005	0.15	8					2.2.1.Floors								
C1-C4	Composite steel deck floors, C25/30, concrete: 120 - 408 kg/m2, steel reinforcement: 1.5 - 26 kg/m2, steel decking: 9.47 kg/m2, • AMCF ArcelorMittal Construction France ds.arcelormittal.com/construction/France o COFRAPLUS 60 o COFRAPLUS 77 o COFRAPLUS 80 o COFRAPLUS 220 o COFRASTRA 40 o COFRASTRA 56 o COFRASTRA 70 • Bacacier www.bacacier.com o PCB 20 o PCB 60 o PCB 80 • JORIS IDE www.joriside.be o PML 60 PC o PML 60 PC PP • Tata Steel France Batiments et systèmes – Monopanel www.monopanel.fr o HI-BOND 55.750 o HI-BOND 55.750 C o HI-BOND 55.800 o HI-BOND 55.800 C o HI-BOND 77.570 (L'ENVELOPPE METALLIQUE DU BATIMENT)	3090.9	m2	2612.3	20.48	4.24	2E-09	2.02	23.37				2.2.1.Floors		As building		Concrete slabs (hollow and solid)	FDES	Preparation of construction waste	P2

C1-C4	Floor screed mortar, cement screed, 1500 kg/m3, EPD coverage: > 1500 kg/m3 (quick-mix Gruppe GmbH & Co. KG)	3090.9	m2	506.14	3.97	0.82	4E-10	0.39	4.53					2.2.1.Floors	As building		Leveling screeds (for floors)	Oekobau.dat 2017-I, EPD Mineralische Werkmörtel: Estrichmörtel - Zementestrich quick-mix Gruppe GmbH & Co. KG	Preparation of construction waste	P2	
C1-C4				3118.4	24.45	5.06	3E-09	2.42	27.9					2.2.1.Floors							
				43120	110.96	16.62	0.0024	7.8	1138.3				203910								
A1-A3	High performance double glazing, 2x4mm magnetron coated glass, 16mm Alu spacer, air/argon/crypton, CLIMAPLUS 4-16-4 (Saint Gobain)	0	m2	0	0	0	0	0	0	0	0	0	0	2.3.5.Rooflights, skylights and openings	sky light	As building	Glass facades and glazing	EPD CLIMAPLUS / CLIMALIT PLUS 4-16-4 / 4-16-33.1 / 4-16-44.2 6-15-4 / 6t-12-6t / 6t-16-6 High performance double glazing		P314	
A1-A3	Aluminium frame profile, powder coated, 1.02 kg/m	0	kg	0	0	0	0	0	0	0	0	0	0	2.3.5.Rooflights, skylights and openings	sky light	As building	Aluminium	Oekobau.dat 2017-I		P4	
A1-A3														2.3.5.Rooflights, skylights and openings	sky light						
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content	14198	kg	9629.3	36.77	5.72	0.0008	4.38	582.63	0	14198			2.3.Roofs, coverings and roof systems	120,0 kg steel/ m3	As building	In-situ concrete roof assembly	Reinforcement for concrete (rebar)	One Click LCA	P4	
A4	Reinforcement steel (rebar), generic, 90% recycled content	14198	kg	59.81	0.28	0.06	1E-05	0.0034	0.18					2.3.Roofs, coverings and roof systems	120,0 kg steel/ m3	As building	In-situ concrete roof assembly	Reinforcement for concrete (rebar)	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P4
C1-C4	Reinforcement steel (rebar), generic, 90% recycled content	14198	kg	110.04	0.44	0.091	2E-05	0.015	0.38					2.3.Roofs, coverings and roof systems	120,0 kg steel/ m3	As building	In-situ concrete roof assembly	Reinforcement for concrete (rebar)	One Click LCA	Steel waste	P4
				9799.1	37.48	5.87	0.0008	4.4	583.2		14198				120,0 kg steel/ m3						
A1-A3	EPS Insulation, T: 10-2400 mm, 600 x 1200 mm, 0.031 W/m2K, 16 kg/m3 (EPS-gruppen)	123.25	m2	6945.4	29.7	5.19	0.0005	9.38	345.9	0	591.6			2.3.Roofs, coverings and roof systems		As building	In-situ concrete roof assembly	EPS (expanded polystyrene) insulation	EPD Lavlambda EPS 80 isolasjon (trykkklasse 80) EPS-gruppen		P7
A1-A3	Glass wool insulation panels, unfaced, generic, 25 kg/m3 (1.56 lbs/ft3), (applicable for densities: 0-25 kg/m3 (0-1.56 lbs/ft3)), Lambda=0.031 W/(m.K)	369.75	m2	3669.9	12.69	1.9	0.0004	0.68	140.38	0	2773.1			2.3.Roofs, coverings and roof systems		As building	In-situ concrete roof assembly	Glass wool insulation	One Click LCA		P3
A1-A3	Plastic vapour control layer, 0.2 mm (Tommen Gram)	493	m2	1756.7	8.06	0.83	4E-05	0.41	0.37	0	91.21			2.3.Roofs, coverings and roof systems	30		In-situ concrete roof assembly	Plastic membranes	Gram Dampspærre, Tommen Gram Folie AS (2015)		P7
A1-A3	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m3 / 24.97 lbs/ft3)	493	m2	43410	91.78	12.22	0.0013	3.85	722.57	0	283968			2.3.Roofs, coverings and roof systems		As building	In-situ concrete roof assembly	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA		P2
A1-A3				55782	142.23	20.14	0.0023	14.32	1209.2		287424			2.3.Roofs, coverings and roof systems							
A4	EPS Insulation, T: 10-2400 mm, 600 x 1200 mm, 0.031 W/m2K, 16 kg/m3 (EPS-gruppen)	123.25	m2	1.81	0.0083	0.0018	4E-07	0.0001	0.0055					2.3.Roofs, coverings and roof systems		As building	In-situ concrete roof assembly	EPS (expanded polystyrene) insulation	EPD Lavlambda EPS 80 isolasjon (trykkklasse 80) EPS-gruppen	Trailer combination, 40 ton capacity, 100% fill rate	P7
A4	Glass wool insulation panels, unfaced, generic, 25 kg/m3 (1.56 lbs/ft3), (applicable for densities: 0-25 kg/m3 (0-1.56 lbs/ft3)), Lambda=0.031 W/(m.K)	369.75	m2	6.37	0.029	0.0064	1E-06	0.0004	0.019					2.3.Roofs, coverings and roof systems		As building	In-situ concrete roof assembly	Glass wool insulation	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P3
A4	Plastic vapour control layer, 0.2 mm (Tommen Gram)	493	m2	0.28	0.0013	0.0003	6E-08	2E-05	0.0009					2.3.Roofs, coverings and roof systems	30		In-situ concrete roof assembly	Plastic membranes	Gram Dampspærre, Tommen Gram Folie AS (2015)	Trailer combination, 40 ton capacity, 100% fill rate	P7
A4	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m3 / 24.97 lbs/ft3)	493	m2	2215	3.24	0.66	0.0004	0.33	12.61					2.3.Roofs, coverings and roof systems		As building	In-situ concrete roof assembly	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Concrete mixer truck, appr. 8 m3, 100% fill rate	P2
A4				2223.4	3.28	0.67	0.0004	0.33	12.63					2.3.Roofs, coverings and roof systems							
B4-B5	Plastic vapour control layer, 0.2 mm (Tommen Gram)	493	m2	1756.7	8.06	0.83	4E-05	0.41	0.37	0	91.21			2.3.Roofs, coverings and roof systems	30		In-situ concrete roof assembly	Plastic membranes	Gram Dampspærre, Tommen Gram Folie AS (2015)	30	P7
C1-C4	EPS Insulation, T: 10-2400 mm, 600 x 1200 mm, 0.031 W/m2K, 16 kg/m3 (EPS-gruppen)	123.25	m2	8.01	0.05	0.0071	1E-10	0.0048	592.43					2.3.Roofs, coverings and roof systems		As building	In-situ concrete roof assembly	EPS (expanded polystyrene) insulation	EPD Lavlambda EPS 80 isolasjon (trykkklasse 80) EPS-gruppen	Disposal of inert material (e.g. Glass) C4	P7
C1-C4	Glass wool insulation panels, unfaced, generic, 25 kg/m3 (1.56 lbs/ft3), (applicable for densities: 0-25 kg/m3 (0-1.56 lbs/ft3)), Lambda=0.031 W/(m.K)	369.75	m2	120.83	0.23	0.11	7E-06	0.032	4310.8					2.3.Roofs, coverings and roof systems		As building	In-situ concrete roof assembly	Glass wool insulation	One Click LCA	Construction waste to landfill	P3
C1-C4	Plastic vapour control layer, 0.2 mm (Tommen Gram)	493	m2	3.97	0.0076	0.0038	2E-07	0.0011	141.78					2.3.Roofs, coverings and roof systems	30		In-situ concrete roof assembly	Plastic membranes	Gram Dampspærre, Tommen Gram Folie AS (2015)	Construction waste to landfill	P7

C1-C4	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m3 / 24.97 lbs/ft3)	493	m2	3149.3	10.15	2.44	0.0006	0.28	13.98				2.3.Roofs, coverings and roof systems	As building	In-situ concrete roof assembly	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Concrete waste	P2
C1-C4				3282.1	10.44	2.57	0.0006	0.32	5059				2.3.Roofs, coverings and roof systems						
				43120	110.96	16.62	0.0024	7.8	1138.3	203910									
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	40.71	m3	11364	24.56	3.29	0.0004	1.04	201.24	0	97704		2.4.1.Stair and ramp structures	As building	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA		P2
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	40.71	m3	762.09	1.11	0.23	0.0001	0.11	4.34				2.4.1.Stair and ramp structures	As building	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Concrete mixer truck, appr. 8 m3, 100% fill rate	P2
C1-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	40.71	m3	1083.6	3.49	0.84	0.0002	0.097	4.81				2.4.1.Stair and ramp structures	As building	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Concrete waste	P2
				13210	29.17	4.36	0.0007	1.25	210.39	97704									
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	14.12	m3	3942.9	8.52	1.14	0.0001	0.36	69.82	0	33899		2.4.1.Stair and ramp structures	As building	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA		P2
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	14.12	m3	264.41	0.39	0.079	5E-05	0.04	1.51				2.4.1.Stair and ramp structures	As building	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Concrete mixer truck, appr. 8 m3, 100% fill rate	P2
C1-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	14.12	m3	375.95	1.21	0.29	7E-05	0.034	1.67				2.4.1.Stair and ramp structures	As building	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Concrete waste	P2
				4583.3	10.12	1.51	0.0002	0.43	73	33899									
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content	4071	kg	2760.9	10.54	1.64	0.0002	1.26	167.05	0	4071		2.4.1.Stair and ramp structures	As building	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA		P4
A4	Reinforcement steel (rebar), generic, 90% recycled content	4071	kg	17.15	0.079	0.017	3E-06	0.001	0.052				2.4.1.Stair and ramp structures	As building	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P4
C1-C4	Reinforcement steel (rebar), generic, 90% recycled content	4071	kg	31.55	0.13	0.026	6E-06	0.0042	0.11				2.4.1.Stair and ramp structures	As building	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Steel waste	P4
				2809.6	10.75	1.68	0.0002	1.26	167.22	4071						Reinforcement for elevator shaft 100 kg/m3			

A1-A3	Reinforcement steel (rebar), generic, 90% recycled content	1412.5	kg	957.92	3.66	0.57	8E-05	0.44	57.96	0	1412.5		2.4.1.Stair and ramp structures	Reinforcement for staircase 100 kg/m3	As building	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA		P4
A4	Reinforcement steel (rebar), generic, 90% recycled content	1412.5	kg	5.95	0.027	0.006	1E-06	0.0003	0.018				2.4.1.Stair and ramp structures	Reinforcement for staircase 100 kg/m3	As building	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P4
C1-C4	Reinforcement steel (rebar), generic, 90% recycled content	1412.5	kg	10.95	0.044	0.009	2E-06	0.0015	0.038				2.4.1.Stair and ramp structures	Reinforcement for staircase 100 kg/m3	As building	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Steel waste	P4
											stair core									
A1-A3	Bricks, 226x104x60, 226x85x60 mm, NF with holes & solid, RF (Wienerberger)	1375.4	m2	52593	92.17	12.59	4E-05	17.87	765.25	0	239663		2.5.1.External enclosing walls above ground floor level		As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Brick, common clay brick	Bricks Wienerberger AS		P33
A1-A3	Masonry mortar, light, 1000 kg/m3 (quick-mix)	1375.4	m2	7387.4	17.77	1.95	2E-06	1.13	296.61	0	13066		2.5.1.External enclosing walls above ground floor level		As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Mortar (masonry/bricklaying)	EPD Mineralische Werkmörtel: Mauerörtel - Leichtmauerörtel quick-mix Gruppe GmbH & Co. KG		P2
A1-A3	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1375.4	m2	4283.3	21.37	1.16	5E-05	1.05	0.51	0	127.22		2.5.1.External enclosing walls above ground floor level		30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plastic membranes	Gram Dampsperr, Tommen Gram Folie AS (2015)		P7
A1-A3	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1375.4	m2	4754.7	21.94	1.74	8E-05	1.12	0.77	0	190.84		2.5.1.External enclosing walls above ground floor level		30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plastic membranes	Gram Dampsperr, Tommen Gram Folie AS (2015)		P7
A1-A3	Plywood, generic, 4-50 mm (0.16-1.97 in), 620 kg/m3 (38.7 lbs/ft3)	1375.4	m2	5054.1	15.57	2.53	0.0007	1.51	257.27	12240	8101.1		2.5.1.External enclosing walls above ground floor level		As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plywood	One Click LCA		P5
A1-A3	Rock wool insulation panels, unfaced, generic, 150 kg/m3 (9.36 lbs/ft3) (applicable for densities: 100-150 kg/m3 (6.24-9.36 lbs/ft3)), Lambda=0.037 W/(m.K)	1375.4	m2	46399	161.74	21.91	0.0009	9.22	886.4	0	35073		2.5.1.External enclosing walls above ground floor level		As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Rock wool insulation	One Click LCA		P3
A1-A3	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3)	1375.4	m2	4359.2	30.66	3.34	0.0002	1.26	188.23	0	14752		2.5.1.External enclosing walls above ground floor level		As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Regular gypsum board	One Click LCA		P232
A1-A3	Gypsum plaster, 1100 kg/m3 (Bundesverband der Gipsindustrie)	1375.4	m2	619.65	0.75	0.098	2E-07	0.087	3.63	0	4538.8		2.5.1.External enclosing walls above ground floor level		30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Gypsum plaster (interior applications)	Oekobau.dat 2017-I, EPD GIPSPUTZ Bundesverband der Gipsindustrie e.V.		P232
A1-A3	Steel stud per m2 of wall area (air gap included), 95 mm, 400 mm spacing	1375.4	m2	3195.5	6.95	0.75	1E-08	1.14	31.88	0	3047.9		2.5.1.External enclosing walls above ground floor level		As building		Structural steel and steel profiles			P4
A1-A3				128646	368.92	46.06	0.002	34.39	2430.5	12240	318560		2.5.1.External enclosing walls above ground floor level							
A4	Bricks, 226x104x60, 226x85x60 mm, NF with holes & solid, RF (Wienerberger)	1375.4	m2	550.64	2.54	0.55	0.0001	0.031	1.68				2.5.1.External enclosing walls above ground floor level		As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Brick, common clay brick	Bricks Wienerberger AS	Trailer combination, 40 ton capacity, 100% fill rate	P33
A4	Masonry mortar, light, 1000 kg/m3 (quick-mix)	1375.4	m2	30.02	0.14	0.03	6E-06	0.0017	0.091				2.5.1.External enclosing walls above ground floor level		As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Mortar (masonry/bricklaying)	EPD Mineralische Werkmörtel: Mauerörtel - Leichtmauerörtel quick-mix Gruppe GmbH & Co. KG	Trailer combination, 40 ton capacity, 100% fill rate	P2
A4	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1375.4	m2	0.39	0.0018	0.0004	8E-08	2E-05	0.0012				2.5.1.External enclosing walls above ground floor level		30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plastic membranes	Gram Dampsperr, Tommen Gram Folie AS (2015)	Trailer combination, 40 ton capacity, 100% fill rate	P7
A4	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1375.4	m2	0.58	0.0027	0.0006	1E-07	3E-05	0.0018				2.5.1.External enclosing walls above ground floor level		30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plastic membranes	Gram Dampsperr, Tommen Gram Folie AS (2015)	Trailer combination, 40 ton capacity, 100% fill rate	P7
A4	Plywood, generic, 4-50 mm (0.16-1.97 in), 620 kg/m3 (38.7 lbs/ft3)	1375.4	m2	40.33	0.19	0.04	8E-06	0.0023	0.12				2.5.1.External enclosing walls above ground floor level		As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plywood	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P5
A4	Rock wool insulation panels, unfaced, generic, 150 kg/m3 (9.36 lbs/ft3) (applicable for densities: 100-150 kg/m3 (6.24-9.36 lbs/ft3)), Lambda=0.037 W/(m.K)	1375.4	m2	80.58	0.37	0.081	2E-05	0.0045	0.25				2.5.1.External enclosing walls above ground floor level		As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Rock wool insulation	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P3

A4	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m ² (2.20 lbs/ft ²) (for 12.5 mm/0.49 in), 858 kg/m ³ (53.6 lbs/ft ³)	1375.4	m ²	33.89	0.16	0.034	7E-06	0.0019	0.1		2.5.1.External enclosing walls above ground floor level	As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Regular gypsum board	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P232	
A4	Gypsum plaster, 1100 kg/m ³ (Bundesverband der Gipsindustrie)	1375.4	m ²	10.43	0.048	0.01	2E-06	0.0006	0.032		2.5.1.External enclosing walls above ground floor level	30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Gypsum plaster (interior applications)	Oekobau.dat 2017-I, EPD GIPSPUTZ Bundesverband der Gipsindustrie e.V.	Trailer combination, 40 ton capacity, 100% fill rate	P232	
A4	Steel stud per m ² of wall area (air gap included), 95 mm, 400 mm spacing	1375.4	m ²	12.84	0.059	0.013	3E-06	0.0007	0.039		2.5.1.External enclosing walls above ground floor level	As building		Structural steel and steel profiles		Trailer combination, 40 ton capacity, 100% fill rate	P4	
A4				759.7	3.5	0.76	0.0002	0.043	2.31		2.5.1.External enclosing walls above ground floor level							
B4-B5	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1375.4	m ²	4283.3	21.37	1.16	5E-05	1.05	0.51	127.22	2.5.1.External enclosing walls above ground floor level	30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plastic membranes	Gram Dampsperr, Tommen Gram Folie AS (2015)	30	P7	
B4-B5	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1375.4	m ²	4754.7	21.94	1.74	8E-05	1.12	0.77	190.84	2.5.1.External enclosing walls above ground floor level	30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plastic membranes	Gram Dampsperr, Tommen Gram Folie AS (2015)	30	P7	
B4-B5	Gypsum plaster, 1100 kg/m ³ (Bundesverband der Gipsindustrie)	1375.4	m ²	619.65	0.75	0.098	2E-07	0.087	3.63	4538.8	2.5.1.External enclosing walls above ground floor level	30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Gypsum plaster (interior applications)	Oekobau.dat 2017-I, EPD GIPSPUTZ Bundesverband der Gipsindustrie e.V.	30	P232	
B4-B5				9657.6	44.06	2.99	0.0001	2.25	4.91	4856.9	2.5.1.External enclosing walls above ground floor level							
C1-C4	Bricks, 226x104x60, 226x85x60 mm, NF with holes & solid, RF (Wienerberger)	1375.4	m ²	2657.9	8.57	2.06	0.0005	0.24	11.8		2.5.1.External enclosing walls above ground floor level	As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Brick, common clay brick	Bricks Wienerberger AS	Brick waste	P33	
C1-C4	Masonry mortar, light, 1000 kg/m ³ (quick-mix)	1375.4	m ²	35.66	0.28	0.058	3E-11	0.028	0.32		2.5.1.External enclosing walls above ground floor level	As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Mortar (masonry/bricklaying)	EPD Mineralische Werkmörtel: Mauermörtel - Leichtmauermörtel quick-mix Gruppe GmbH & Co. KG	Preparation of construction waste	P2	
C1-C4	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1375.4	m ²	5.54	0.011	0.0053	3E-07	0.0015	197.77		2.5.1.External enclosing walls above ground floor level	30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plastic membranes	Gram Dampsperr, Tommen Gram Folie AS (2015)	Construction waste to landfill	P7	
C1-C4	Plastic vapour control layer, 0.2 mm (Tommen Gram)	1375.4	m ²	8.32	0.016	0.0079	5E-07	0.0022	296.66		2.5.1.External enclosing walls above ground floor level	30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plastic membranes	Gram Dampsperr, Tommen Gram Folie AS (2015)	Construction waste to landfill	P7	
C1-C4	Plywood, generic, 4-50 mm (0.16-1.97 in), 620 kg/m ³ (38.7 lbs/ft ³)	1375.4	m ²	73.23	1.78	2.35	9E-06	0.024	79.63		2.5.1.External enclosing walls above ground floor level	As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Plywood	One Click LCA	Wood waste	P5	
C1-C4	Rock wool insulation panels, unfaced, generic, 150 kg/m ³ (9.36 lbs/ft ³) (applicable for densities: 100-150 kg/m ³ (6.24-9.36 lbs/ft ³)), Lambda=0.037 W/(m.K)	1375.4	m ²	1528.2	2.93	1.45	9E-05	0.41	54521		2.5.1.External enclosing walls above ground floor level	As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Rock wool insulation	One Click LCA	Construction waste to landfill	P3	
C1-C4	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m ² (2.20 lbs/ft ²) (for 12.5 mm/0.49 in), 858 kg/m ³ (53.6 lbs/ft ³)	1375.4	m ²	642.77	1.23	0.61	4E-05	0.17	22932		2.5.1.External enclosing walls above ground floor level	As building	Timber Frame Cavity Wall & Service Void, U-value 0.22	Regular gypsum board	One Click LCA	Construction waste to landfill	P232	
C1-C4	Gypsum plaster, 1100 kg/m ³ (Bundesverband der Gipsindustrie)	1375.4	m ²	12.39	0.097	0.02	1E-11	0.0096	0.11		2.5.1.External enclosing walls above ground floor level	30	Timber Frame Cavity Wall & Service Void, U-value 0.22	Gypsum plaster (interior applications)	Oekobau.dat 2017-I, EPD GIPSPUTZ Bundesverband der Gipsindustrie e.V.	Preparation of construction waste	P232	
C1-C4	Steel stud per m ² of wall area (air gap included), 95 mm, 400 mm spacing	1375.4	m ²	23.62	0.094	0.02	5E-06	0.0032	0.082		2.5.1.External enclosing walls above ground floor level	As building		Structural steel and steel profiles		Steel waste	P4	
C1-C4				4987.7	15	6.58	0.0006	0.89	78039		2.5.1.External enclosing walls above ground floor level							
				43120	110.96	16.62	0.0024	7.8	1138.3	203910								
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content	9482.4	kg	6430.9	24.55	3.82	0.0005	2.92	389.11	0	9482.4	2.5.2.External enclosing walls below ground level	120,0 kg steel/m ³	As building	In-situ concrete wall assembly, incl. mineral wool insulation	Reinforcement for concrete (rebar)	One Click LCA	P4
A4	Reinforcement steel (rebar), generic, 90% recycled content	9482.4	kg	39.94	0.18	0.04	8E-06	0.0023	0.12		2.5.2.External enclosing walls below ground level	120,0 kg steel/m ³	As building	In-situ concrete wall assembly, incl. mineral wool insulation	Reinforcement for concrete (rebar)	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P4
C1-C4	Reinforcement steel (rebar), generic, 90% recycled content	9482.4	kg	73.49	0.29	0.061	1E-05	0.0099	0.26		2.5.2.External enclosing walls below ground level	120,0 kg steel/m ³	As building	In-situ concrete wall assembly, incl. mineral wool insulation	Reinforcement for concrete (rebar)	One Click LCA	Steel waste	P4
				6544.3	25.03	3.92	0.0006	2.94	389.49	9482.4								
																	120,0 kg steel/m³	

A1-A3	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora, Kolibri Sand, Paneelikattomaali, Ranch, Superlateksi, Tapettipohjamaali, Teknospro, Tela, Timantti, Trend (Teknos)	52.94	kg	165.3	1.93	0.25	7E-06	0.1	7.59	0	52.94		2.5.2.External enclosing walls below ground level	For inner wall, average spread rate 10.15 m2/l	15		In-situ concrete wall assembly, incl. mineral wool insulation	Paints, coatings and lacquers	EPD RTS EPD, Water-borne interior paints		P7	
A4	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora, Kolibri Sand, Paneelikattomaali, Ranch, Superlateksi, Tapettipohjamaali, Teknospro, Tela, Timantti, Trend (Teknos)	52.94	kg	0.64	0.0026	0.0006	1E-07	5E-05	0.0019				2.5.2.External enclosing walls below ground level	For inner wall, average spread rate 10.15 m2/l	15		In-situ concrete wall assembly, incl. mineral wool insulation	Paints, coatings and lacquers	EPD RTS EPD, Water-borne interior paints	Large delivery truck, 9 ton capacity, 100% fill rate	P7	
B4-B5	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora, Kolibri Sand, Paneelikattomaali, Ranch, Superlateksi, Tapettipohjamaali, Teknospro, Tela, Timantti, Trend (Teknos)	52.94	kg	495.89	5.8	0.75	2E-05	0.31	22.77		52.94		2.5.2.External enclosing walls below ground level	For inner wall, average spread rate 10.15 m2/l	15		In-situ concrete wall assembly, incl. mineral wool insulation	Paints, coatings and lacquers	EPD RTS EPD, Water-borne interior paints	15,30,45	P7	
C1-C4	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora, Kolibri Sand, Paneelikattomaali, Ranch, Superlateksi, Tapettipohjamaali, Teknospro, Tela, Timantti, Trend (Teknos)	52.94	kg	0.72	0.0044	0.0006	1E-11	0.0004	53.01				2.5.2.External enclosing walls below ground level	For inner wall, average spread rate 10.15 m2/l	15		In-situ concrete wall assembly, incl. mineral wool insulation	Paints, coatings and lacquers	EPD RTS EPD, Water-borne interior paints	Disposal of inert material (e.g. Glass) C4	P7	
												retaining walls										
A1-A3	Glass wool insulation panels, unfaced, generic, 25 kg/m3 (1.56 lbs/ft3), (applicable for densities: 0-25 kg/m3 (0-1.56 lbs/ft3)), Lambda=0.031 W/(m.K)	395.1	m2	2941.2	10.17	1.52	0.0004	0.54	112.51	0	2222.4		2.5.2.External enclosing walls below ground level		As building		In-situ concrete wall assembly, incl. mineral wool insulation	Glass wool insulation	One Click LCA		P3	
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	395.1	m2	22059	47.68	6.39	0.0007	2.02	390.62	0	189648		2.5.2.External enclosing walls below ground level		As building		In-situ concrete wall assembly, incl. mineral wool insulation	Ready-mix concrete for external walls and floors	One Click LCA		P2	
A1-A3				25000	57.84	7.91	0.001	2.57	503.12		191870		2.5.2.External enclosing walls below ground level									
A4	Glass wool insulation panels, unfaced, generic, 25 kg/m3 (1.56 lbs/ft3), (applicable for densities: 0-25 kg/m3 (0-1.56 lbs/ft3)), Lambda=0.031 W/(m.K)	395.1	m2	5.11	0.024	0.0051	1E-06	0.0003	0.016				2.5.2.External enclosing walls below ground level		As building		In-situ concrete wall assembly, incl. mineral wool insulation	Glass wool insulation	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P3	
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	395.1	m2	1479.3	2.16	0.44	0.0003	0.22	8.42				2.5.2.External enclosing walls below ground level		As building		In-situ concrete wall assembly, incl. mineral wool insulation	Ready-mix concrete for external walls and floors	One Click LCA	Concrete mixer truck, appr. 8 m3, 100% fill rate	P2	
A4				1484.4	2.19	0.45	0.0003	0.22	8.44				2.5.2.External enclosing walls below ground level									
C1-C4	Glass wool insulation panels, unfaced, generic, 25 kg/m3 (1.56 lbs/ft3), (applicable for densities: 0-25 kg/m3 (0-1.56 lbs/ft3)), Lambda=0.031 W/(m.K)	395.1	m2	96.84	0.19	0.092	6E-06	0.026	3454.8				2.5.2.External enclosing walls below ground level		As building		In-situ concrete wall assembly, incl. mineral wool insulation	Glass wool insulation	One Click LCA	Construction waste to landfill	P3	
C1-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	395.1	m2	2103.2	6.78	1.63	0.0004	0.19	9.33				2.5.2.External enclosing walls below ground level		As building		In-situ concrete wall assembly, incl. mineral wool insulation	Ready-mix concrete for external walls and floors	One Click LCA	Concrete waste	P2	
C1-C4				2200.1	6.96	1.72	0.0004	0.21	3464.1				2.5.2.External enclosing walls below ground level									
				43120	110.96	16.62	0.0024	7.8	1138.3		203910											
A1-A3	Glass façade curtain wall system, max. thickness: 50mm, R: 1.3 W/m2K, R50SG Glass System R50-V130 / R50-H100 (Riventi)	0	m2	0	0	0	0	0	0	0	0		2.5.3.Solar / Rain screening	50 mm, 1.3 W/m2K	As building		Curtain wall assembly, glass with aluminium frame	Glass facades and glazing	EPD Curtain wall system with four configurations R50T / R50SG / R70ST / MODULAR RDS		P314	
A1-A3	High performance double glazing, 2x4mm magnetron coated glass, 16mm Alu spacer, air/argon/crypton, CLIMAPLUS 4-16-4 (Saint Gobain)	349.4	m2	13319	60.92	14.9	8E-07	3.94	342.06	0	6988		2.6.1.External Windows		As building			Glass facades and glazing	EPD CLIMAPLUS / CLIMALIT PLUS 4-16-4 / 4-16-33.1 / 4-16-44.2 6-15-4 / 6t-12-6t / 6t-16-6	High performance double glazing		P314
A1-A3	Aluminium frame profile, powder coated, 1.02 kg/m	4297.6	kg	55892	263.11	17.85	6E-07	14.6	13059	0	4297.6		2.6.1.External Windows		As building			Aluminium	Oekobau.dat 2017-I		P4	
A1-A3				69211	324.03	32.75	1E-06	18.54	13401		11286		2.6.1.External Windows									
A4	High performance double glazing, 2x4mm magnetron coated glass, 16mm Alu spacer, air/argon/crypton, CLIMAPLUS 4-16-4 (Saint Gobain)	349.4	m2	16.06	0.074	0.016	3E-06	0.0009	0.049				2.6.1.External Windows		As building			Glass facades and glazing	EPD CLIMAPLUS / CLIMALIT PLUS 4-16-4 / 4-16-33.1 / 4-16-44.2 6-15-4 / 6t-12-6t / 6t-16-6	High performance double glazing	Trailer combination, 40 ton capacity, 100% fill rate	P314
A4	Aluminium frame profile, powder coated, 1.02 kg/m	4297.6	kg	18.1	0.083	0.018	4E-06	0.001	0.055				2.6.1.External Windows		As building			Aluminium	Oekobau.dat 2017-I	Trailer combination, 40 ton capacity, 100% fill rate	P4	
A4				34.16	0.16	0.034	7E-06	0.0019	0.1				2.6.1.External Windows									

C1-C4	High performance double glazing, 2x4mm magnetron coated glass, 16mm Alu spacer, air/argon/crypton, CLIMAPLUS 4-16-4 (Saint Gobain)	349.4	m2	19.07	0.15	0.031	2E-11	0.015	0.17										2.6.1.External Windows	As building		Glass facades and glazing	EPD CLIMAPLUS / CLIMALIT PLUS 4-16-4 / 4-16-33.1 / 4-16-44.2 6-15-4 / 6t-12-6t / 6t-16-6	Preparation of construction waste	P314		
C1-C4	Aluminium frame profile, powder coated, 1.02 kg/m	4297.6	kg	3.47	0.021	0.0028	3E-12	0.0016	215.26										2.6.1.External Windows	As building		Aluminium	Oekobau.dat 2017-1	End of life of aluminium m C4	P4		
C1-C4		22.54		0.17	0.034	2E-11	0.016	215.43											2.6.1.External Windows								
		43120		110.96	16.62	0.0024	7.8	1138.3																			
A1-A3	Structural steel profiles, generic, 60% recycled content, I, H, U, L, and T sections	6479.4	kg	13809	52.45	8.24	0.001	6.76	749.57	0	6479.4								2.7.1.Internal Walls and Partitions	As building	Estimated 1.23 kg/m and 600 mm spacing	Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Structural steel and steel profiles	One Click LCA		P4	
A4	Structural steel profiles, generic, 60% recycled content, I, H, U, L, and T sections	6479.4	kg	27.29	0.13	0.027	5E-06	0.0015	0.083										2.7.1.Internal Walls and Partitions	As building	Estimated 1.23 kg/m and 600 mm spacing	Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Structural steel and steel profiles	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P4	
C1-C4	Structural steel profiles, generic, 60% recycled content, I, H, U, L, and T sections	6479.4	kg	50.22	0.2	0.041	1E-05	0.0067	0.17										2.7.1.Internal Walls and Partitions	As building	Estimated 1.23 kg/m and 600 mm spacing	Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Structural steel and steel profiles	One Click LCA	Steel waste	P4	
				13886	52.78	8.3	0.0011	6.76	749.83		6479.4																
A1-A3	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora, Kolibri Sand, Paneelkattomaali, Ranch, Superlateksi, Tapettipohjamaali, Teknospro, Tela, Timantti, Trend (Teknos)	846.81	kg	2644.1	30.93	3.99	0.0001	1.64	121.42	0	846.81								2.7.1.Internal Walls and Partitions	As building	For both sides of wall, average spread rate 10.15 m2/l	15	Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Paints, coatings and lacquers	EPD RTS EPD, Water-borne interior paints		P7
A4	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora, Kolibri Sand, Paneelkattomaali, Ranch, Superlateksi, Tapettipohjamaali, Teknospro, Tela, Timantti, Trend (Teknos)	846.81	kg	10.21	0.041	0.0089	2E-06	0.0009	0.03										2.7.1.Internal Walls and Partitions	As building	For both sides of wall, average spread rate 10.15 m2/l	15	Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Paints, coatings and lacquers	EPD RTS EPD, Water-borne interior paints	Large delivery truck, 9 ton capacity, 100% fill rate	P7
B4-B5	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora, Kolibri Sand, Paneelkattomaali, Ranch, Superlateksi, Tapettipohjamaali, Teknospro, Tela, Timantti, Trend (Teknos)	846.81	kg	7932.2	92.79	11.98	0.0003	4.91	364.25		846.81								2.7.1.Internal Walls and Partitions	As building	For both sides of wall, average spread rate 10.15 m2/l	15	Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Paints, coatings and lacquers	EPD RTS EPD, Water-borne interior paints	15,30,45	P7
C1-C4	Water-borne interior paints, 1.36 kg/L, average coverage 8-10 m2/L, Biora, Ekora, Kolibri Sand, Paneelkattomaali, Ranch, Superlateksi, Tapettipohjamaali, Teknospro, Tela, Timantti, Trend (Teknos)	846.81	kg	11.46	0.071	0.01	2E-10	0.0069	848.01										2.7.1.Internal Walls and Partitions	As building	For both sides of wall, average spread rate 10.15 m2/l	15	Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Paints, coatings and lacquers	EPD RTS EPD, Water-borne interior paints	Disposal of inert material (e.g. Glass) C4	P7
				10598	123.83	15.99	0.0005	6.55	1333.7		1693.6																
A1-A3	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3)	3160.7	m2	10418	73.28	7.98	0.0005	3.01	449.86	0	35256								2.7.1.Internal Walls and Partitions	As building		Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Regular gypsum board	One Click LCA		P232	
A1-A3	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3)	3160.7	m2	10418	73.28	7.98	0.0005	3.01	449.86	0	35256								2.7.1.Internal Walls and Partitions	As building		Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Regular gypsum board	One Click LCA		P232	
A1-A3	Glass wool insulation panels, unfaced, generic, 25 kg/m3 (1.56 lbs/ft3), (applicable for densities: 0-25 kg/m3 (0-1.56 lbs/ft3)), Lambda=0.031 W/(m.K)	3160.7	m2	7320	25.31	3.79	0.0009	1.35	280.01	0	5531.2								2.7.1.Internal Walls and Partitions	As building		Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Glass wool insulation	One Click LCA		P3	
A1-A3				28156	171.86	19.75	0.0019	7.38	1179.7		76042								2.7.1.Internal Walls and Partitions								
A4	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3)	3160.7	m2	81	0.37	0.081	2E-05	0.0046	0.25										2.7.1.Internal Walls and Partitions	As building		Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Regular gypsum board	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P232	
A4	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3)	3160.7	m2	81	0.37	0.081	2E-05	0.0046	0.25										2.7.1.Internal Walls and Partitions	As building		Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Regular gypsum board	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P232	
A4	Glass wool insulation panels, unfaced, generic, 25 kg/m3 (1.56 lbs/ft3), (applicable for densities: 0-25 kg/m3 (0-1.56 lbs/ft3)), Lambda=0.031 W/(m.K)	3160.7	m2	12.71	0.059	0.013	3E-06	0.0007	0.039										2.7.1.Internal Walls and Partitions	As building		Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Glass wool insulation	One Click LCA	Trailer combination, 40 ton capacity, 100% fill rate	P3	
A4				174.71	0.8	0.18	4E-05	0.0099	0.53										2.7.1.Internal Walls and Partitions								
C1-C4	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3)	3160.7	m2	1536.2	2.94	1.46	9E-05	0.41	54805										2.7.1.Internal Walls and Partitions	As building		Steel stud internal wall assembly, 70 mm, incl. mineral wool insulation	Regular gypsum board	One Click LCA	Construction waste to landfill	P232	

