Statement of Verification

BREG EN EPD No: 000723 Issue: 02

This is to verify that the Environmental Product Declaration provided by:

Wembley Innovation

are in accordance with the requirements of:

EN 15804:2012+A2:2019

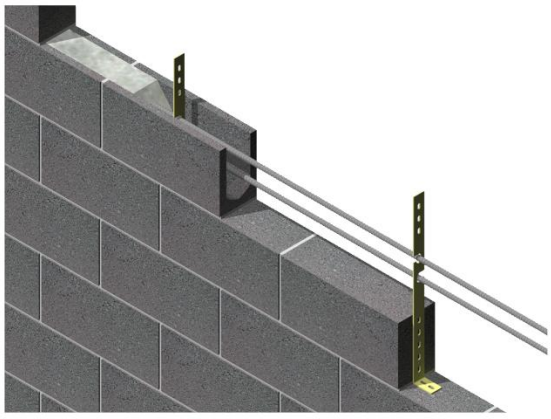
and

BRE Global Scheme Document SD207

This declaration is for:
1m^2 of 140mm thick 7.3N Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars (272 kg/m^2).

Company Address

Wembley Innovation
Unit 5 Fourth Way
Wembley, London
HA9 0LH,
United Kingdom



Signed for BRE Global Limited	Hayley Thomson Operator	
06 March 2026 Date of this Issue	16 January 2026 Date of First Issue	15 January 2031 Expiry Date

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Environmental Product Declaration

EPD Number: 000723

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE 2023 Product Category Rules (PN 514 Rev 3.2) for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019
Commissioner of LCA study	**LCA consultant/Tool**
Wembley Innovation Unit 5 Fourth Way Wembley, London HA9 0LH, United Kingdom	Francis Yu/ BRE LINA A2
Declared/Functional Unit	**Applicability/Coverage**
1m^2 of 140mm thick 7.3N Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars (272 kg/m^2).	Product Specific.
EPD Type	**Background database**
Cradle to Gate with options	Ecoinvent 3.8

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☒Internal ☐ External
(Where appropriate [b])Third party verifier: Bala Subramanian
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance

Information modules covered

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑		☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Haughley Block Plant Ltd.
Station Road,
Haughley,
Suffolk,
IP14 3QP

Construction Product:

Product Description

Wi blocks are made of cement, aggregates and water. The blocks covered by this EPD are manufactured with semi-dry components, accurately weighed, thoroughly mixed before adding a measured amount of water. This semi dry mix is fed into a mould and mechanically pressed to form the block shape. Once demoulded, the blocks are cured in a warm and humid chamber, then moved externally for storage. Wi blocks are used in a variety of applications including both interior and exterior load bearing and non-load bearing walls.

Wi Beam and Trough blocks by Wembley Innovation are designed to provide an alternative to heavyweight precast concrete lintels. Wi Trough Lintels integrate with blockwork walls, considerably improving finished appearance. The patented Wi Beam and Trough Lintel U-blocks allow the construction of integral reinforced concrete lintels within blockwork construction, which eliminate the need for traditional heavyweight lintels. The LCA results listed in this product specific EPD are for 1m^2 of 140mm 7.3N Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars (272 kg/m^2). The 272 kg/m^2 declared weight is based on the as-manufactured weight for whole system, which includes the dry weight of 140mm 7.3N block itself (122 kg/m^2) manufactured by Wembley Innovation, and the weight of Wi mortar, concrete and rebars (150 kg/m^2) supplied by third parties. Wi System elements fall under Wembley Innovation patents, with structural capacities based on real-life empirical tests and defined materials. Therefore, deviation is not allowed from Wembley Innovation Design Guide bending moments, created and based over five years of forensic testing, furthermore no deviation from supplied Wembley Innovation materials to protect Wembley Innovation's intellectual property and product liability.

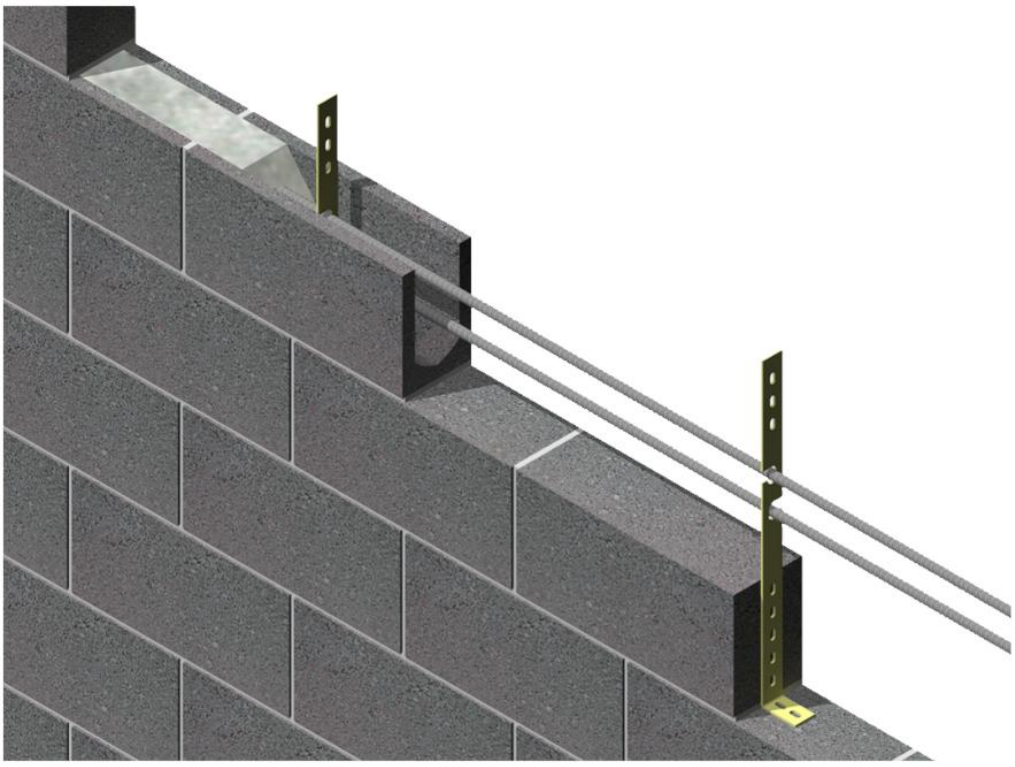
This EPD can also be used for other different thicknesses of the product as they have the same design and composition, i.e. 1m^2 of 100mm/190mm/215mm 7.3N Wi Beam Blocks and Wi Trough Blocks filled with Wi

Mortar and Rebars. The corresponding LCA results can be calculated using the conversion factors from the end-user table in the Interpretation section of the EPD.

Technical Information

Property	Value, Unit
Harmonised standard	EN 771-3:2011+A1:2015
Quality Management System compliance	ISO 9001
Category I, Manufacturing Control compliance	BS EN 1996-1-1: 2005
Dimensions (mm)	W: 100mm/140mm/190mm/215mm, L: 440mm, H: 215mm
Dimensional tolerances	Category: D1
Characteristic compressive strength	Notional value: 7.3 N/mm²
Net dry density of concrete block (without Wi Mortar infill)	1400-1600 kg/m^3
Weight for the block only (L:440mm x H:215mm x W:140mm)	122 kg/m^2
Reaction to fire	Euroclass A1 (BS EN 13501-1 classification)

Note: The technical properties are extracted from the Wembley Innovation technical data sheet and apply to all 7.3N Beam Blocks and Wi Trough Blocks covered in the EPD and the end-user table. Please contact Wembley Innovation for details.



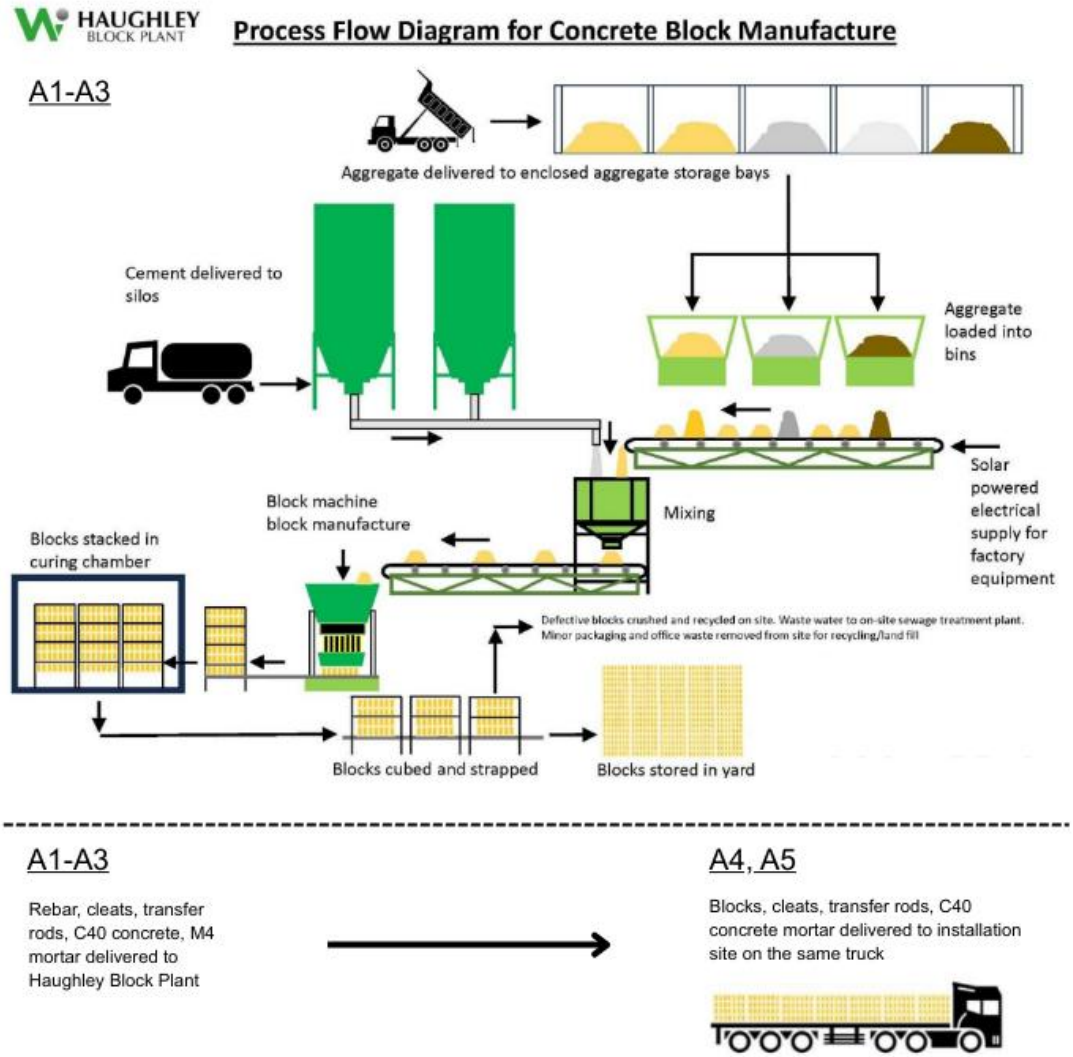
Main Product Contents for the whole system - 140mm 7.3N Beam Wi Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars

Material/Chemical Input	%
Pumice	19
Sand	13
Limestone Dust	9
Cement	6
Mortar	7
Concrete	40
Steel rebar	6

Manufacturing Process

Aggregates and cement are delivered to the factory where they are mixed and transported via conveyors to the block machine which manufactures modular/special block units. These units are then stacked in the curing chambers. Post curing chamber, they are taken to the cuber, strapped and banded. They are then stored in the yard and loaded onto lorries for customer distribution. All infill materials are transported to Haughley Block Plant and then sent directly to the installation site alongside the manufactured blocks. The Haughley Block Plant factory recycles 100% of factory produced product waste.

Process flow diagram



Note: the manufacturing process diagram covers the whole system of Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars

Construction Installation

Wi Beam blocks and Wi Trough Lintels are constructed in situ using the patented Wi Beam and Trough Lintel U-blocks, C40 Wi Mortar concrete, H16 B500C rebars, Wi Transfer Rods and Wi End Cleats, if required. The construction of walls and Wi Beam blocks and Trough Lintels should be in accordance with BS EN 1996: (1-1: 2005, 1-2: 2005) and 2: 2006) as well normal good practice. Refer to Wembley Innovation's Wi System User Manual for detailed installation guidance.

Use Information

There is no energy use associated with the product once installed.

End of Life

At the end-of-life stage, the concrete block walls are crushed and screened on site as part of the building demolition. Industrial average end-of-life data has been used for this EPD, according to BRE PCR for Type III EPD of Construction Products to EN 15804+A2, 95% of the concrete blocks are recycled as aggregates and 5% are sent to landfill. 95% of the steel rebars are recycled and 5% are sent to landfill.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1m^2 of 140mm thick 7.3N Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars (272 kg/m^2).

System boundary

This cradle-to-gate with options EPD has assessed in accordance with the modular approach as defined in EN15804:2012+A2:2019 and BRE 2023 Product Category Rules (PN 514 Rev 3.2) and includes,

A1–A3 (Product stage):
This includes the raw materials used to manufacture Beam/Trough Blocks at the Wembley Innovation Facility, as well as the concrete and rebar used to install the product. The concrete and rebar are manufactured by a third-party company and delivered directly to the Wembley Innovation Facility. Transport associated with delivering the concrete and rebar is included in Module A2.

A4 (Transport):
Transportation of Beam/Trough Blocks from the Wembley Innovation Facility to the construction site.

A5 (Installation):
Installation of the product at the construction site.

C1–C4 (End-of-life):
End-of-life processes.

D (Beyond the system boundary):
Benefits and loads beyond the system boundary.

Data sources, quality and allocation

Specific primary data derived from Wembley Innovation's production facility at Haughley Block Plant, Station Road, Haughley, Suffolk, IP14 3QP, have been modelled using the LINA LCA A2 software and the ecoinvent 3.8 database. In accordance with the requirements of EN 15804:2012+A2:2019, the most current available data has been used. The manufacturer-specific data from Wembley Innovation covers a period of one year (01/10/2023 – 30/09/2024). Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production) from the ecoinvent 3.8 database. Renewable electricity (from mono solar PV) has been used in the EPD. Wi blocks production data includes data for all product variants. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN 15804:2012+A2:2019.

The LCAs are based on 140mm 7.3N Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars, which account for 1% of Wembley Innovation total production. A list of conversion factors has been attached at the end of EPD for other variants (100/190/215mm 7.3N Wi Beam Blocks and Wi Trough Blocks). Since the EPD is for the whole system, the materials used for infill – such as mortar, concrete and rebar - have been modelled in module A1 of the LCA. All the products have similar composition and manufacturing processes, therefore they are listed in the same EPD. Wembley Innovation manufactures other products in addition to Wi Beam Blocks and Wi Trough Blocks series, therefore, an allocation of fuel, water, material usage, and waste are required. All energy, water and waste have been allocated to the products by square metre according to the provisions of the BRE PCR PN514 Rev 3.2 and EN 15804:2012+A2:2019. Site wide values for energy, water and wastewater have been taken from bills. Figures for the raw materials, ancillary materials and packaging were from actual usages.

Haughley Block Plant is 100% solar with significant surplus generation sold back into the grid, Haughley Block Plant solar installation generates 200,147kWh of solar electricity and imports from the grid 84,636kWh per year.

Quality Level	Geographical representativeness	Technical representativeness	Time representativeness
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e. identical technology).	There is less than 5 years between the ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific UK datasets have been selected from the ecoinvent LCI for this LCA. The quality level of geographical and technical representativeness is therefore very good. The quality level of time representativeness is good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

UK consumption mix (2022) was used for electricity with an emissions factor of 0.239 kgCO2e/kWh.
UK renewable electricity (roof, mono solar PV) was used with an emission factor of 0.125 kgCO2e/kWh.

Cut-off criteria

All raw materials, packaging materials, transportation, process energy, general energy, water use and non-production waste have been included where appropriate. Direct emissions to air, water and soil are not produced and have been excluded. No production waste is generated as all waste materials are crushed and re-used on site in the same production process. Upstream extraction and/or processing of inputs are included within the use of the background datasets within LINA.

LCA Results – 140mm 7.3N Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars (272 kg/m^2).

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CFC11 eq	mol H^+ eq	kg $(PO_4)^{3-}$ eq
Product stage	Raw material supply	A1	3.57E+01	3.52E+01	4.20E-01	5.42E-02	1.91E-06	1.14E-01	3.69E-03
	Transport	A2	1.95E+00	1.95E+00	1.85E-03	7.14E-04	4.63E-07	8.10E-03	1.22E-04
	Manufacturing	A3	-8.64E-01	4.55E-01	-1.32E+00	1.60E-03	6.57E-08	3.22E-03	1.46E-04
	Total (Consumption grid)	A1-3	3.68E+01	3.76E+01	-9.00E-01	5.65E-02	2.44E-06	1.25E-01	3.96E-03
Construction process stage	Transport	A4	3.98E+00	3.97E+00	3.86E-03	1.43E-03	9.49E-07	1.66E-02	2.47E-04
	Construction	A5	1.10E+00	1.13E+00	-2.70E-02	1.70E-03	7.34E-08	3.76E-03	1.19E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% to recycling and 5% to landfill Scenario									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	9.05E-01	9.04E-01	7.71E-04	3.55E-04	2.09E-07	3.67E-03	5.82E-05
	Waste processing	C3	1.91E+00	1.91E+00	6.75E-04	1.91E-04	4.09E-07	1.99E-02	5.93E-05
	Disposal	C4	7.18E-02	7.16E-02	7.10E-05	6.76E-05	2.90E-08	6.73E-04	6.56E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.98E+00	-5.96E+00	-1.36E-02	-3.95E-03	-3.20E-07	-2.73E-02	-2.65E-03

GWP-total = Global warming potential, total;
GWP-fossil = Global warming potential, fossil;
GWP-biogenic = Global warming potential, biogenic;
GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;
AP = Acidification potential, accumulated exceedance; and
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral& metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m^3 world eq deprived	disease incidence
Product stage	Raw material supply	A1	3.24E-02	3.66E-01	9.62E-02	1.48E-04	2.90E+02	1.06E+01	1.38E-06
	Transport	A2	2.46E-03	2.69E-02	8.59E-03	4.92E-06	3.02E+01	1.44E-01	2.18E-07
	Manufacturing	A3	1.02E-03	1.11E-02	3.62E-03	8.59E-06	8.27E+00	2.84E-01	7.09E-08
	Total (Consumption grid)	A1-3	3.59E-02	4.04E-01	1.08E-01	1.61E-04	3.28E+02	1.10E+01	1.67E-06
Construction process stage	Transport	A4	5.06E-03	5.53E-02	1.78E-02	9.11E-06	6.19E+01	2.99E-01	4.67E-07
	Construction	A5	1.08E-03	1.21E-02	3.26E-03	4.85E-06	9.87E+00	3.30E-01	5.01E-08
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% to recycling and 5% to landfill Scenario									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.11E-03	1.21E-02	3.70E-03	3.14E-06	1.37E+01	6.15E-02	7.80E-08
	Waste processing	C3	8.81E-03	9.65E-02	2.65E-02	9.84E-07	2.63E+01	6.07E-02	2.33E-06
	Disposal	C4	2.34E-04	2.56E-03	7.46E-04	1.63E-07	2.00E+00	9.17E-02	1.36E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.38E-03	-7.20E-02	-2.91E-02	-2.20E-05	-6.95E+01	-4.14E+00	-4.28E-07

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
EP-terrestrial = Eutrophication potential, accumulated exceedance;
POCP = Formation potential of tropospheric ozone;
ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;
ADP-fossil = Depletion potential of the stratospheric ozone layer;
WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
PM = Particulate matter.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts							
			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U^{235} eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.85E+00	4.29E+02	4.45E-08	1.23E-06	4.10E+02
	Transport	A2	1.53E-01	2.36E+01	6.74E-10	2.56E-08	3.20E+01
	Manufacturing	A3	9.46E-02	1.10E+01	1.90E-09	1.09E-08	1.19E+02
	Total (Consumption grid)	A1-3	2.10E+00	4.64E+02	4.70E-08	1.27E-06	5.60E+02
Construction process stage	Transport	A4	3.13E-01	4.84E+01	1.34E-09	5.29E-08	7.09E+01
	Construction	A5	6.30E-02	1.39E+01	1.41E-09	3.80E-08	1.68E+01
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% to recycling and 5% to landfill Scenario							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	7.03E-02	1.07E+01	3.45E-10	1.12E-08	9.39E+00
	Waste processing	C3	1.18E-01	1.54E+01	5.94E-10	1.11E-08	3.34E+00
	Disposal	C4	8.88E-03	1.26E+00	3.21E-11	8.31E-10	4.20E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.29E-01	-1.52E+02	-2.31E-08	-1.17E-07	-3.50E+01

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;
HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use, primary energy

			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	4.42E+01	0.00E+00	4.42E+01	2.98E+02	0.00E+00	2.98E+02
	Transport	A2	3.92E-01	0.00E+00	3.92E-01	2.97E+01	0.00E+00	2.97E+01
	Manufacturing	A3	1.17E+01	1.28E+01	2.45E+01	7.95E+00	7.30E-01	8.68E+00
	Total (Consumption grid)	A1-3	5.63E+01	1.28E+01	6.91E+01	3.36E+02	7.30E-01	3.36E+02
Construction process stage	Transport	A4	7.88E-01	0.00E+00	7.88E-01	6.08E+01	0.00E+00	6.08E+01
	Construction	A5	1.69E+00	3.83E-01	2.07E+00	9.86E+00	2.37E-01	1.01E+01
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% to recycling and 5% to landfill Scenario								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.93E-01	0.00E+00	1.93E-01	1.34E+01	0.00E+00	1.34E+01
	Waste processing	C3	1.47E-01	0.00E+00	1.47E-01	2.57E+01	0.00E+00	2.57E+01
	Disposal	C4	1.71E-02	0.00E+00	1.71E-02	1.96E+00	0.00E+00	1.96E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.60E+00	0.00E+00	-3.60E+00	-6.92E+01	0.00E+00	-6.92E+01

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
PERM = Use of renewable primary energy resources used as raw materials;
PERT = Total use of renewable primary energy resources;
PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
PENRM = Use of non-renewable primary energy resources used as raw materials;
PENRT = Total use of non-renewable primary energy resource

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	1.69E+01	0.00E+00	0.00E+00	2.77E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.55E-03
	Manufacturing	A3	4.84E-02	1.24E-06	0.00E+00	7.05E-03
	Total (Consumption grid)	A1-3	1.69E+01	1.24E-06	0.00E+00	2.88E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	7.37E-03
	Construction	A5	5.08E-01	3.71E-08	0.00E+00	8.64E-03
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% to recycling and 5% to landfill Scenario						
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	1.52E-03
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.50E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	2.14E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-9.81E-02

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	6.31E-01	1.63E+01	1.33E-03
	Transport	A2	3.21E-02	5.61E-01	2.05E-04
	Manufacturing	A3	3.06E-02	6.13E-01	4.06E-05
	Total (Consumption grid)	A1-3	6.94E-01	1.75E+01	1.57E-03
Construction process stage	Transport	A4	6.53E-02	1.13E+00	4.20E-04
	Construction	A5	2.09E-02	5.25E-01	4.72E-05
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
95% to recycling and 5% to landfill Scenario					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.51E-02	2.68E-01	9.25E-05
	Waste processing	C3	3.45E-02	2.42E-01	1.81E-04
	Disposal	C4	2.08E-03	2.94E-02	1.31E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.35E-01	-1.27E+01	-1.93E-04

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	3.32E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	2.15E-05	9.16E-09	9.88E-04	0.00E+00	4.02E-01
	Total (Consumption grid)	A1-3	0.00E+00	3.32E+00	9.16E-09	9.88E-04	0.00E+00	4.02E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	1.04E-01	2.75E-10	2.97E-05	0.00E+00	1.21E-02
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% to recycling and 5% to landfill Scenario								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	1.74E-05	2.78E-07	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

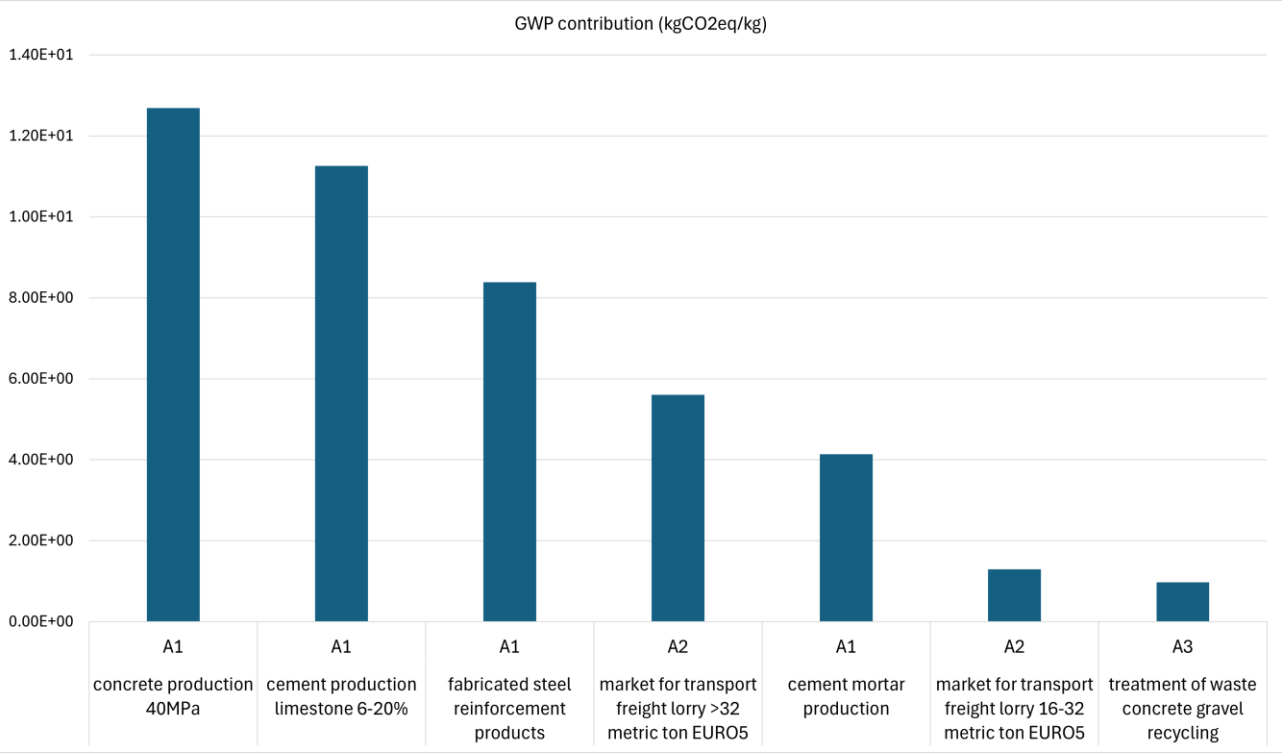
Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Close to 100% of the production goes to London (161km) Very small amounts are sold locally, 161km will be used to be conservative.		
	Fuel type / Vehicle type	Litre of fuel type per distance or vehicle type	Lorry,>32 metric ton
	Distance:	km	161
A5 – Installation in the building	Wi Beam blocks and Trough Lintels are constructed in situ using the patented Wi Beam and Trough Lintel U-blocks, C40 Wi Mortar concrete, H16 B500C rebars, Wi Transfer Rods and Wi End Cleats, if required. The product is manually installed, energy / fuel is negligible. For more information about installation, please refer to the link https://www.wembleyinnovation.co.uk		
	Installation wastage rate	%	3
	Material loss	kg	8.16
	Plastic strapping waste to recycling	kg	0.00506
	Wood waste to recycling	kg	1.0267
B2 – Maintenance	Maintenance not required - once walling is installed, it is static and inert.		
B3 – Repair	Repair not required - once walling is installed, it is static and inert.		
B4 – Replacement	Replacement not required - once walling is installed, it will satisfy the intended function for the life of the building.		
B5 – Refurbishment	Refurbishment not required - once walling is installed, it will satisfy the intended function for the life of the building.		
B6 – Use of energy; B7 – Use of water	There is no operational energy and water use required - once walling is installed, it is static and inert.		
C1 to C4 End of life,			
C1 – Deconstruction	Walling is dismantled manually or mechanically as part of the whole building demolition process, then crushed and screened for recycled hardcore. No data is available for deconstruction from the manufacturer. 100% recovery rate of the product has been assumed at its end of life.	MJ	0
C2 – Transport from site to pre-processing facility or landfill	A common practice is that the deconstructed walling is crushed on site and transported locally for re-use as hardcore. But a typical 20km assumption has also been given in this module in case an external crushing facility is used.		
	Road, 16-32 metric ton, euro5	km	20
C3 - Pre-processing of uninstalled product	There is currently no process in place to dispose of the product waste by the manufacturer. Therefore, industrial average end-of-life data for 'Block, concrete (dense)' and 'Reinforcement steel' has been used according to BRE PCR PN 514 Rev 3.2, i.e. 95% of concrete waste to recycling and 95% of steel waste to recycling. Therefore, 95% x 254.79 = 242.05 kg of concrete waste is recycled. 95% 17.21= 16.35 kg of steel is recycled.		
	Concrete waste to recycling	kg	242.05

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
	Steel waste to recycling	kg	16.35
C4 – Disposal	There is currently no process in place to dispose of the product waste by the manufacturer. Therefore, industrial average end-of-life data for 'Block, concrete (dense)' and 'Reinforcement steel' has been used according to BRE PCR PN 514 Rev 3.2, i.e. 5% of concrete waste to landfill and 5% of steel waste to landfill. Therefore, 5% x 254.79 = 12.74 kg of concrete waste is landfilled. 5% x 17.21 = 0.86 kg of steel is landfilled.		
	Concrete waste to landfill	kg	12.74
	Steel waste to landfill	kg	0.86
Module D	95% i.e. 242.05 kg of concrete waste will be sent to recycling plant. Out of which, the raw materials of the concrete contain 0% of existing post-consumer scrap. Therefore, 100% of the concrete is from virgin materials and the benefits due to recycling of 242.05 kg can be declared in Module D. 95% i.e. 16.35 kg of steel waste will be sent to recycling plant. Out of which, the raw materials of the steel contain 85.7% of existing post-consumer scrap. Therefore, 14.3.% of the steel is from virgin materials and the benefits due to recycling of 16.35* 14.3% = 2.338 kg can be declared in Module D.		
	Benefits due to recycling of concrete waste	kg	242.05
	Benefits due to recycling of steel waste	kg	2.338

Interpretation

Out of the total mass of input materials for Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars, concrete accounts for 40%, purmice accounts for 19%, sand accounts for 13%, limestone dust accounts for 9%, and other materials account for the remaining of 19%. The bulk of the environmental impacts and primary energy demand are attributed to the manufacturing phase, covered by information modules A1-A3 of EN15804:2012+A2:2019.

As a result, 40MPa concrete infill contributes the most on overall environmental impacts, followed by cement.



End-user table

The LCA results in the EPD are for 1m^2 of 140mm 7.3N Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars (272 kg/m^2). The environmental impacts of other product sizes in this series can be obtained from multiplying the 140mm 7.3N LCA results by the conversion factors below. The proportion/breakdown of impacts remain the same throughout the range.

(For example, to calculate the environment impacts of 100mm 7.3N Wi Beam Blocks and Wi Trough Blocks filled with Wi Mortar and Rebars, the EPD users need to multiply the conversion factor 0.756 by the LCA results of 140mm 7.3N blocks. To calculate the environment impacts of 190mm 7.3N blocks, the EPD users need to multiply the conversion factor 1.397 by the LCA results of 140mm 7.3N blocks).

Block sizes (mm)	Weight (kg/m^2)	Conversion Factors
100mm 7.3N (L:440x H:215 x W:100)	205.6	0.756
140mm 7.3N (L:440x H:215 x W:140)	272.0	1
190mm 7.3N (L:440x H:215 x W:190)	380.0	1.397
215mm 7.3N (L:440x H:215 x W:215)	431.1	1.585

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