Statement of Verification

BREG EN EPD No.: 000670 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Haughley Block Plant Ltd

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

1m2 of 100mm thick 7.3N/10.4N HBP Solid Dense Blocks (191kg/m2, L:440mm x H:215mm x W:100mm).

Company Address

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

HAUGHLEY BLOCK PLANT

Signed for BRE Global Ltd	Hayley Thomson Operator	25 March 2025 Date of this Issue
25 March 2025 Date of First Issue		24 March 2030 Expiry Date

BRE Global Verified EPD

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ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EPD Number: 000670

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 3.1) for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019
Commissioner of LCA study	**LCA consultant/Tool**
Haughley Block Plant Ltd Station Road Haughley, Stowmarket Suffolk IP14 3QP	Francis Yu/ BRE LINA A2
Declared Unit	**Applicability/Coverage**
1m^2 of 100mm thick 7.3N/10.4N HBP Solid Dense Blocks (191kg/m^2, L:440mm x H:215mm x W:100mm).	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

HBP 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.

HBP blocks are used in a variety of applications including both interior and exterior load bearing and non-load bearing walls.

The LCA results listed in this product specific EPD are for 1m^2 of 100mm 7.3N Solid Dense Blocks (191kg/m2) and 1m^2 of 100mm 10.4N Solid Dense Blocks (191kg/m^2).

This EPD can also be used for other different thicknesses of the products as they have the same design and composition, i.e. 1m^2 of 140mm 7.3N/10.4N Solid Dense Blocks, 1m^2 of 190mm 7.3N/10.4N Solid Dense Blocks, 1m^2 of 215mm 7.3N/10.4N Solid Dense Blocks. 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, ISO 14001 and ISO 45001
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 Flatness: NPD Parallelism: NPD
Configuration	Group 1 Solid
Dimensional stability	Moisture movement <=0.6mm/m
Shear bond	0.15N/mm² (fixed value)
Flexural bond strength	NPD
Characteristic compressive strength	7.3N/mm², 10.4N/mm² (⊥ bed face)
Net dry density of concrete	1900-2100 kg/m3
Reaction to fire	Euroclass A1
Water absorption	NPD
Water Vapour Diffusion	5/15μ (fixed value)
Thermal conductivity	P = 50% 1.14W/(m.K) [λ10,dry]
Durability against freeze-thaw	Can be used below ground up to sulphate soil class DS-3
Reaction to fire	Classification to EN 13501-1: A1

Note: The technical properties are extracted from the HBP technical data sheet and apply to all 7.3N/10.4N HBP Solid Dense Blocks covered in the EPD and the end-user table. Please contact Haughley Block Plant Ltd for details.

Main Product Contents - 100mm 7.3N HBP Solid Dense Blocks

Material/Chemical Input	%
Grit	34
Stone	17
Sand	43
Cement	6

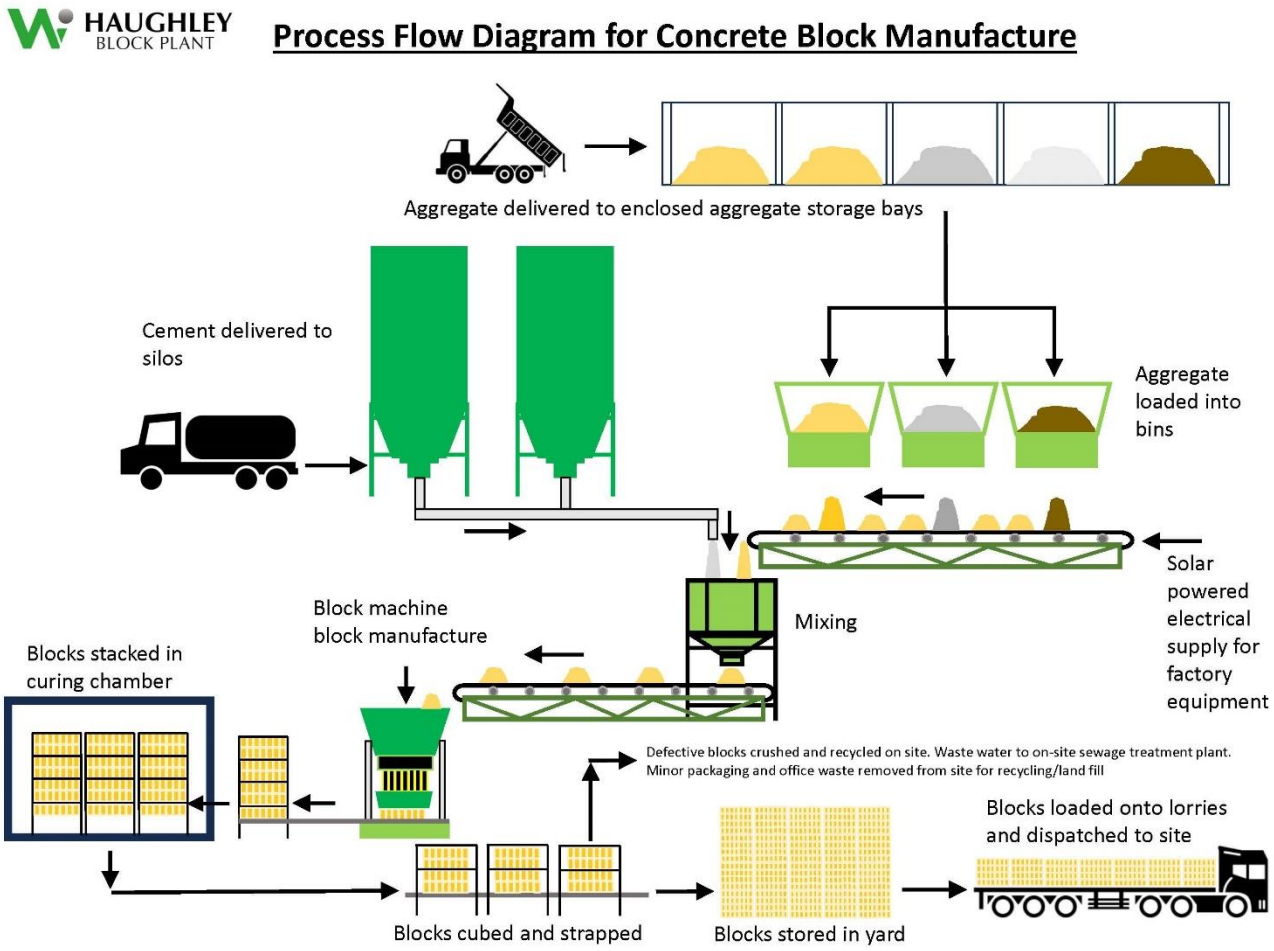
Main Product Contents - 100mm 10.4N HBP Solid Dense Blocks

Material/Chemical Input	%
Grit	34
Stone	17
Sand	43
Cement	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.
The Haughley Block Plant factory recycles 100% of factory produced product waste.

Process flow diagram



Construction Installation

All block products are manually constructed to create block walling. The construction of walls should be in accordance with BS EN 1996: (1-1: 2005, 1-2: 2005) and 2: 2006) and normal good practice. For use above DPC, the blocks should be laid using mortar strength class M4. Below DPC level strength class M4, or M6, can be used depending on the risk of saturation and freezing.

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 BRE PCR for Type III EPD of Construction Products to EN 15804+A2,Eventually 95% of the concrete blocks are recycled as aggregates and 5% are sent to landfill.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1m2 of 100mm thick 7.3N/10.4N HBP Solid Dense Blocks (191kg/m2, L:440mm x H:215mm x W:100mm).

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 3.1) and includes the processes covered in the manufacturing site and product stage A1 to A3, A4-A5, B1-B7, C1-C4 and D.

Data sources, quality and allocation

Specific primary data derived from Haughley Block Plant Ltd's production process at Station Road, Haughley, Suffolk, IP14 3QP factory, 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 Haughley Block Plant Ltd 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. HBP 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 100mm 7.3N and 10.4N HBP Solid Dense Blocks, which accounts for 17.8% and 1.4% of Haughley Block Plant total production. A list of conversion factors has been attached at the end of EPD for other variants (140/190/215mm, 7.3/10.4N HBP Solid Dense Blocks). All the products have similar composition and manufacturing processes, therefore they are listed in the same EPD. Haughley Block Plant Ltd manufactures other products in addition to HBP Solid Dense Block 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 3.1 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 was used for electricity with an emissions factor of 0.239kgCO2e/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 – 100mm 7.3N HBP Solid Dense Blocks (191kg/m2)

(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	9.28E+00	9.17E+00	1.00E-01	4.20E-03	3.66E-07	3.05E-02	1.41E-03
	Transport	A2	4.13E-01	4.12E-01	3.98E-04	1.49E-04	9.83E-08	1.72E-03	2.57E-05
	Manufacturing	A3	-1.14E+00	6.43E-01	-1.79E+00	2.20E-03	9.27E-08	4.54E-03	2.04E-04
	Total (of product stage)	A1-3	8.55E+00	1.02E+01	-1.69E+00	6.55E-03	5.57E-07	3.68E-02	1.64E-03
Construction process stage	Transport	A4	1.13E+00	1.13E+00	1.09E-03	4.05E-04	2.69E-07	4.70E-03	7.01E-05
	Construction	A5	2.60E-01	3.10E-01	-5.06E-02	1.98E-04	1.69E-08	1.11E-03	4.96E-05
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	6.36E-01	6.35E-01	5.41E-04	2.49E-04	1.47E-07	2.58E-03	4.09E-05
	Waste processing	C3	7.29E-01	7.29E-01	2.57E-04	7.28E-05	1.56E-07	7.58E-03	2.26E-05
	Disposal	C4	5.04E-02	5.03E-02	4.98E-05	4.75E-05	2.03E-08	4.73E-04	4.60E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.53E+00	-1.51E+00	-1.95E-02	-2.13E-03	-1.21E-07	-9.69E-03	-8.20E-04

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	8.51E-03	9.68E-02	2.45E-02	3.08E-05	5.16E+01	8.84E+00	2.74E-07
	Transport	A2	5.24E-04	5.72E-03	1.84E-03	9.67E-07	6.41E+00	3.09E-02	4.79E-08
	Manufacturing	A3	1.45E-03	1.57E-02	5.10E-03	1.23E-05	1.17E+01	3.93E-01	9.95E-08
	Total (of product stage)	A1-3	1.05E-02	1.18E-01	3.15E-02	4.41E-05	6.97E+01	9.26E+00	4.22E-07
Construction process stage	Transport	A4	1.43E-03	1.57E-02	5.05E-03	2.58E-06	1.76E+01	8.48E-02	1.32E-07
	Construction	A5	3.18E-04	3.57E-03	9.53E-04	1.34E-06	2.12E+00	2.79E-01	1.28E-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	7.76E-04	8.48E-03	2.60E-03	2.21E-06	9.60E+00	4.32E-02	5.48E-08
	Waste processing	C3	3.36E-03	3.68E-02	1.01E-02	3.75E-07	1.00E+01	2.31E-02	1.55E-06
	Disposal	C4	1.64E-04	1.80E-03	5.24E-04	1.15E-07	1.40E+00	6.44E-02	9.52E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.23E-03	-2.69E-02	-6.93E-03	-1.42E-05	-2.22E+01	-2.89E+00	-1.22E-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	3.68E-01	1.21E+02	2.58E-09	8.08E-08	3.80E+01
	Transport	A2	3.25E-02	5.01E+00	1.40E-10	5.47E-09	7.21E+00
	Manufacturing	A3	1.35E-01	1.54E+01	2.59E-09	1.53E-08	1.61E+02
	Total (of product stage)	A1-3	5.35E-01	1.42E+02	5.31E-09	1.02E-07	2.06E+02
Construction process stage	Transport	A4	8.88E-02	1.37E+01	3.79E-10	1.50E-08	2.01E+01
	Construction	A5	1.62E-02	4.29E+00	1.63E-10	3.08E-09	6.20E+00
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	4.93E-02	7.49E+00	2.43E-10	7.85E-09	6.59E+00
	Waste processing	C3	4.51E-02	5.85E+00	2.26E-10	4.24E-09	1.27E+00
	Disposal	C4	6.24E-03	8.87E-01	2.25E-11	5.84E-10	2.95E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.43E-01	-2.57E+01	-1.49E-09	-2.69E-08	-2.04E+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	3.47E+00	0.00E+00	3.47E+00	5.12E+01	0.00E+00	5.12E+01
	Transport	A2	8.20E-02	0.00E+00	8.20E-02	6.30E+00	0.00E+00	6.30E+00
	Manufacturing	A3	1.61E+01	1.73E+01	3.34E+01	1.12E+01	1.06E+00	1.23E+01
	Total (of product stage)	A1-3	1.97E+01	1.73E+01	3.70E+01	6.87E+01	1.06E+00	6.98E+01
Construction process stage	Transport	A4	2.23E-01	0.00E+00	2.23E-01	1.72E+01	0.00E+00	1.72E+01
	Construction	A5	5.91E-01	5.19E-01	1.11E+00	1.71E+00	3.82E-01	2.10E+00
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	1.35E-01	0.00E+00	1.35E-01	9.42E+00	0.00E+00	9.42E+00
	Waste processing	C3	5.60E-02	0.00E+00	5.60E-02	9.81E+00	0.00E+00	9.81E+00
	Disposal	C4	1.20E-02	0.00E+00	1.20E-02	1.38E+00	0.00E+00	1.38E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.09E+00	0.00E+00	-2.09E+00	-2.22E+01	0.00E+00	-2.22E+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	1.89E-02	0.00E+00	0.00E+00	2.08E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	7.61E-04
	Manufacturing	A3	6.56E-02	1.80E-06	0.00E+00	9.79E-03
	Total (of product stage)	A1-3	8.44E-02	1.80E-06	0.00E+00	2.18E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.09E-03
	Construction	A5	2.53E-03	5.41E-08	0.00E+00	6.56E-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	1.07E-03
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	5.71E-04
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.51E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-6.84E-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	2.39E-01	6.63E+00	2.10E-04
	Transport	A2	6.77E-03	1.18E-01	4.11E+01
	Manufacturing	A3	4.28E-02	8.56E-01	5.77E-05
	Total (of product stage)	A1-3	2.88E-01	7.61E+00	4.11E+01
Construction process stage	Transport	A4	1.85E-02	3.22E-01	1.18E+02
	Construction	A5	8.74E-03	2.30E-01	1.23E+00
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	1.06E-02	1.88E-01	6.49E-05
	Waste processing	C3	1.31E-02	9.22E-02	6.91E-05
	Disposal	C4	1.46E-03	2.06E-02	9.21E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.28E-01	-3.88E+00	-1.13E-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	0.00E+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	3.13E-05	1.33E-08	1.44E-03	0.00E+00	-5.44E-01
	Total (of product stage)	A1-3	0.00E+00	3.13E-05	1.33E-08	1.44E-03	0.00E+00	-5.44E-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	7.46E-03	4.00E-10	4.32E-05	0.00E+00	-1.63E-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	1.31E-05	2.09E-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

LCA Results – 100mm 10.4N HBP Solid Dense Blocks (191kg/m2)

(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	1.01E+01	9.99E+00	1.09E-01	4.49E-03	3.93E-07	3.28E-02	1.50E-03
	Transport	A2	4.25E-01	4.24E-01	4.10E-04	1.53E-04	1.01E-07	1.77E-03	2.65E-05
	Manufacturing	A3	-1.13E+00	6.54E-01	-1.79E+00	2.21E-03	9.43E-08	4.63E-03	2.06E-04
	Total (of product stage)	A1-3	9.40E+00	1.11E+01	-1.68E+00	6.85E-03	5.89E-07	3.92E-02	1.74E-03
Construction process stage	Transport	A4	1.13E+00	1.13E+00	1.09E-03	4.05E-04	2.69E-07	4.70E-03	7.01E-05
	Construction	A5	2.85E-01	3.35E-01	-5.04E-02	2.08E-04	1.79E-08	1.19E-03	5.25E-05
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	6.36E-01	6.35E-01	5.41E-04	2.49E-04	1.47E-07	2.58E-03	4.09E-05
	Waste processing	C3	7.29E-01	7.29E-01	2.57E-04	7.28E-05	1.56E-07	7.58E-03	2.26E-05
	Disposal	C4	5.04E-02	5.03E-02	4.98E-05	4.75E-05	2.03E-08	4.73E-04	4.60E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.53E+00	-1.51E+00	-1.95E-02	-2.13E-03	-1.21E-07	-9.69E-03	-8.20E-04

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	9.17E-03	1.04E-01	2.64E-02	3.30E-05	5.53E+01	8.90E+00	2.91E-07
	Transport	A2	5.39E-04	5.90E-03	1.89E-03	9.96E-07	6.61E+00	3.18E-02	4.93E-08
	Manufacturing	A3	1.47E-03	1.60E-02	5.19E-03	1.26E-05	1.19E+01	3.96E-01	1.01E-07
	Total (of product stage)	A1-3	1.12E-02	1.26E-01	3.35E-02	4.66E-05	7.38E+01	9.32E+00	4.41E-07
Construction process stage	Transport	A4	1.43E-03	1.57E-02	5.05E-03	2.58E-06	1.76E+01	8.48E-02	1.32E-07
	Construction	A5	3.39E-04	3.81E-03	1.01E-03	1.41E-06	2.25E+00	2.80E-01	1.34E-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	7.76E-04	8.48E-03	2.60E-03	2.21E-06	9.60E+00	4.32E-02	5.48E-08
	Waste processing	C3	3.36E-03	3.68E-02	1.01E-02	3.75E-07	1.00E+01	2.31E-02	1.55E-06
	Disposal	C4	1.64E-04	1.80E-03	5.24E-04	1.15E-07	1.40E+00	6.44E-02	9.52E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.23E-03	-2.69E-02	-6.93E-03	-1.42E-05	-2.22E+01	-2.89E+00	-1.22E-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	3.87E-01	1.32E+02	2.74E-09	8.70E-08	4.02E+01
	Transport	A2	3.34E-02	5.16E+00	1.44E-10	5.64E-09	7.43E+00
	Manufacturing	A3	1.38E-01	1.56E+01	2.60E-09	1.55E-08	1.61E+02
	Total (of product stage)	A1-3	5.58E-01	1.52E+02	5.48E-09	1.08E-07	2.09E+02
Construction process stage	Transport	A4	8.88E-02	1.37E+01	3.79E-10	1.50E-08	2.01E+01
	Construction	A5	1.69E-02	4.61E+00	1.68E-10	3.28E-09	6.28E+00
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	4.93E-02	7.49E+00	2.43E-10	7.85E-09	6.59E+00
	Waste processing	C3	4.51E-02	5.85E+00	2.26E-10	4.24E-09	1.27E+00
	Disposal	C4	6.24E-03	8.87E-01	2.25E-11	5.84E-10	2.95E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.43E-01	-2.57E+01	-1.49E-09	-2.69E-08	-2.04E+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	3.70E+00	0.00E+00	3.70E+00	5.48E+01	0.00E+00	5.48E+01
	Transport	A2	8.44E-02	0.00E+00	8.44E-02	6.49E+00	0.00E+00	6.49E+00
	Manufacturing	A3	1.62E+01	1.73E+01	3.35E+01	1.14E+01	1.08E+00	1.25E+01
	Total (of product stage)	A1-3	2.00E+01	1.73E+01	3.73E+01	7.28E+01	1.08E+00	7.38E+01
Construction process stage	Transport	A4	2.23E-01	0.00E+00	2.23E-01	1.72E+01	0.00E+00	1.72E+01
	Construction	A5	6.01E-01	5.19E-01	1.12E+00	1.82E+00	3.99E-01	2.22E+00
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	1.35E-01	0.00E+00	1.35E-01	9.42E+00	0.00E+00	9.42E+00
	Waste processing	C3	5.60E-02	0.00E+00	5.60E-02	9.81E+00	0.00E+00	9.81E+00
	Disposal	C4	1.20E-02	0.00E+00	1.20E-02	1.38E+00	0.00E+00	1.38E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.09E+00	0.00E+00	-2.09E+00	-2.22E+01	0.00E+00	-2.22E+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	1.94E-02	0.00E+00	0.00E+00	2.09E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	7.84E-04
	Manufacturing	A3	6.56E-02	1.86E-06	0.00E+00	9.89E-03
	Total (of product stage)	A1-3	8.50E-02	1.86E-06	0.00E+00	2.20E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.09E-03
	Construction	A5	2.55E-03	5.58E-08	0.00E+00	6.61E-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	1.07E-03
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	5.71E-04
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.51E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-6.84E-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	2.54E-01	7.08E+00	2.24E-04
	Transport	A2	6.97E-03	1.21E-01	4.24E+01
	Manufacturing	A3	4.34E-02	8.67E-01	5.89E-05
	Total (of product stage)	A1-3	3.05E-01	8.07E+00	4.24E+01
Construction process stage	Transport	A4	1.85E-02	3.22E-01	1.18E+02
	Construction	A5	9.23E-03	2.43E-01	1.27E+00
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	1.06E-02	1.88E-01	6.49E-05
	Waste processing	C3	1.31E-02	9.22E-02	6.91E-05
	Disposal	C4	1.46E-03	2.06E-02	9.21E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.28E-01	-3.88E+00	-1.13E-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	0.00E+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	3.23E-05	1.38E-08	1.49E-03	0.00E+00	-5.44E-01
	Total (of product stage)	A1-3	0.00E+00	3.23E-05	1.38E-08	1.49E-03	0.00E+00	-5.44E-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	7.81E-03	4.13E-10	4.46E-05	0.00E+00	-1.63E-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	1.31E-05	2.09E-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	14% of the production goes to London (161km) 86% of the production is sold locally (50km average) So the total average for the factory is 65km.		
	Fuel type / Vehicle type	Litre of fuel type per distance or vehicle type	Lorry,>32 metric ton
	Distance:	km	65
	Bulk density of transported products	kg/m^3	1900-2100
A5 – Installation in the building	All block products are manually constructed to create block walling. The product is manually installed, energy / fuel is negligible.		
	Installation wastage rate	%	3
	Material loss	kg	5.73
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,	Description of scenario		
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)' has been used according to BRE PCR PN 514 Rev 3.1, i.e. 95% of waste to recycling. So 95% x 191 = 181.45 kg will be recycled.		
	Concrete waste to recycling	kg	181.45
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)' has been used according to BRE PCR PN 514 Rev 3.1, i.e. 5% of waste to landfill. So 5% x 191 = 9.55kg will be landfilled.		
	Concrete waste to landfill	kg	9.55

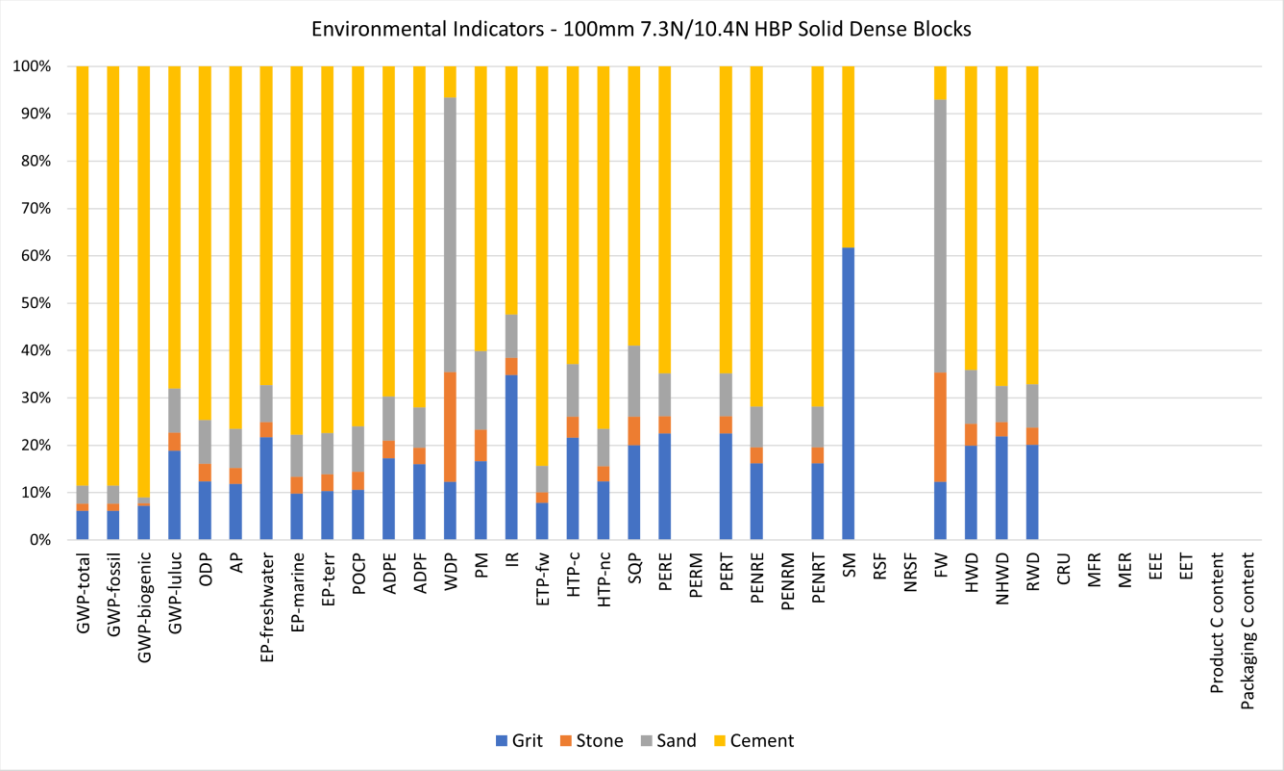
Scenarios and additional technical information			
Scenario	Parameter	Units	Results
Module D	95% i.e. 181.45 kg of concrete waste will be sent to recycling plant. Out of which, aggregate, sand and CEM II contain 0% of existing post-consumer waste. Therefore, 100% of the concrete block waste to recycling benefits can be declared in Module D, i.e. 181.45kg.		
	Benefits due to recycling (100mm 7.3N blocks)	kg	181.45
	Benefits due to recycling (100mm 10.4N blocks)	kg	181.45

Interpretation

1 m^2 of 100mm 7.3N/10.4N HBP Solid Dense Blocks have the same composition and similar percentage of composition, and the differences are less than 10%. Therefore, the 100mm 7.3N blocks, which have the largest production quantity, are used as a representative in the Interpretation section.

Out of the total mass of input materials, grit accounts for 34%, stone accounts for 17%, sand accounts for 43%, and cement accounts for 6%. 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, cement (CEM II/AL) contributes the most on overall environmental impacts.



End-user table

The LCA results in the EPD are for 1m^2 of 100mm 7.3N Solid Dense Blocks (191kg/m^2) and 100mm 10.4N Solid Dense Blocks (191kg/m^2). The environmental impacts of other product sizes in this series can be obtained from multiplying the 100mm 7.3N and 100mm 10.4N 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 140mm 7.3N blocks, the EPD users need to multiply the conversion factor 1.35 by the LCA results of 100mm 7.3N blocks. To calculate the environment impacts of 140mm 10.4N blocks, the EPD users need to multiply the conversion factor 1.35 by the LCA results of 100mm 10.4N blocks).

Block sizes (mm)	Weight (kg/m^2)	Conversion Factors
100mm 7.3N (L:440x H:215 x W:100)	191	1
100mm 10.4N (L:440x H:215 x W:100)	191	1
140mm 7.3N (L:440x H:215 x W:140)	257	1.35
140mm 10.4N (L:440x H:215 x W:140)	257	1.35
190mm 7.3N (L:440x H:215 x W:190)	352	1.84
190mm 10.4N (L:440x H:215 x W:190)	352	1.84
215mm 7.3N (L:440x H:215 x W:215)	393	2.06
215mm 10.4N (L:440x H:215 x W:215)	393	2.06

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