

Statement of Verification

BREG EN EPD No.: 000674

Issue 01

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



is in accordance with the requirements of:
EN 15804:2012+A2:2019
and
BRE Global Scheme Document SD207

This declaration is for:
1 tonne of Granite aggregate

Company Address

Holcim UK Limited,
Bardon Hill,
Leicestershire,
England,
LE67 1TL



Emma Baker
Scheme Operator

10 April 2025
Date of this Issue

10 April 2025
Date of First Issue

09 April 2030
Expiry Date



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Environmental Product Declaration

EPD Number: 000674

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
Holcim UK Limited, Bardon Hill, Leicestershire, England, LE67 1TL	LCA consultant: Chi Zhang/Bala Subramanian Tool: BRE LINA A2
Declared/Functional Unit	Applicability/Coverage
1 tonne of Granite aggregate	Product Specific.
EPD Type	Background database
Cradle to Gate with Modules C and D	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 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(Where appropriate ^b) Third-party verifier: Flavie Lowres	
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
A1	A2	A3	A4	A5	Related to the building fabric				Related to the building			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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Bardon Hill Quarry

Bardon,
Coalville,
Leicestershire,
LE67 1TL

Construction Product:

Product Description

Aggregate Industries UK Ltd is an aggregate supplier across the UK, with a commitment to service quality, innovation, and environmental responsibility. The Bardon Hill Quarry, located just 500 meters from the factory, is one of the key quarries under Aggregate Industries UK Ltd, which provides granite aggregates. This EPD, the data represent a typical 1000kg of granite rock aggregate from Bardon Hill Quarry, including all stages of the processes required to obtain the products. These products are used in a variety of applications including asphalt, ready-mixed and precast concrete, coastal and river defence and road construction.

Technical Information

Property	Test Standard	Value, Unit
Size	-	Various
Oven Dry Relative Density	BS EN 1097-6	2690 - 2730 kg/m ³
Apparent Relative Density	BS EN 1097-6	2760 - 2780 kg/m ³
Saturated Surface Dry Relative Density	BS EN 1097-6	2720 – 2750 kg/m ³
Water Absorption	BS EN 1097-6	0.7 - 1.0%

Note: The test results listed above correspond to typical aggregate sizes For other technical information, please contact Aggregate Industry UK Ltd.



Main Product Contents

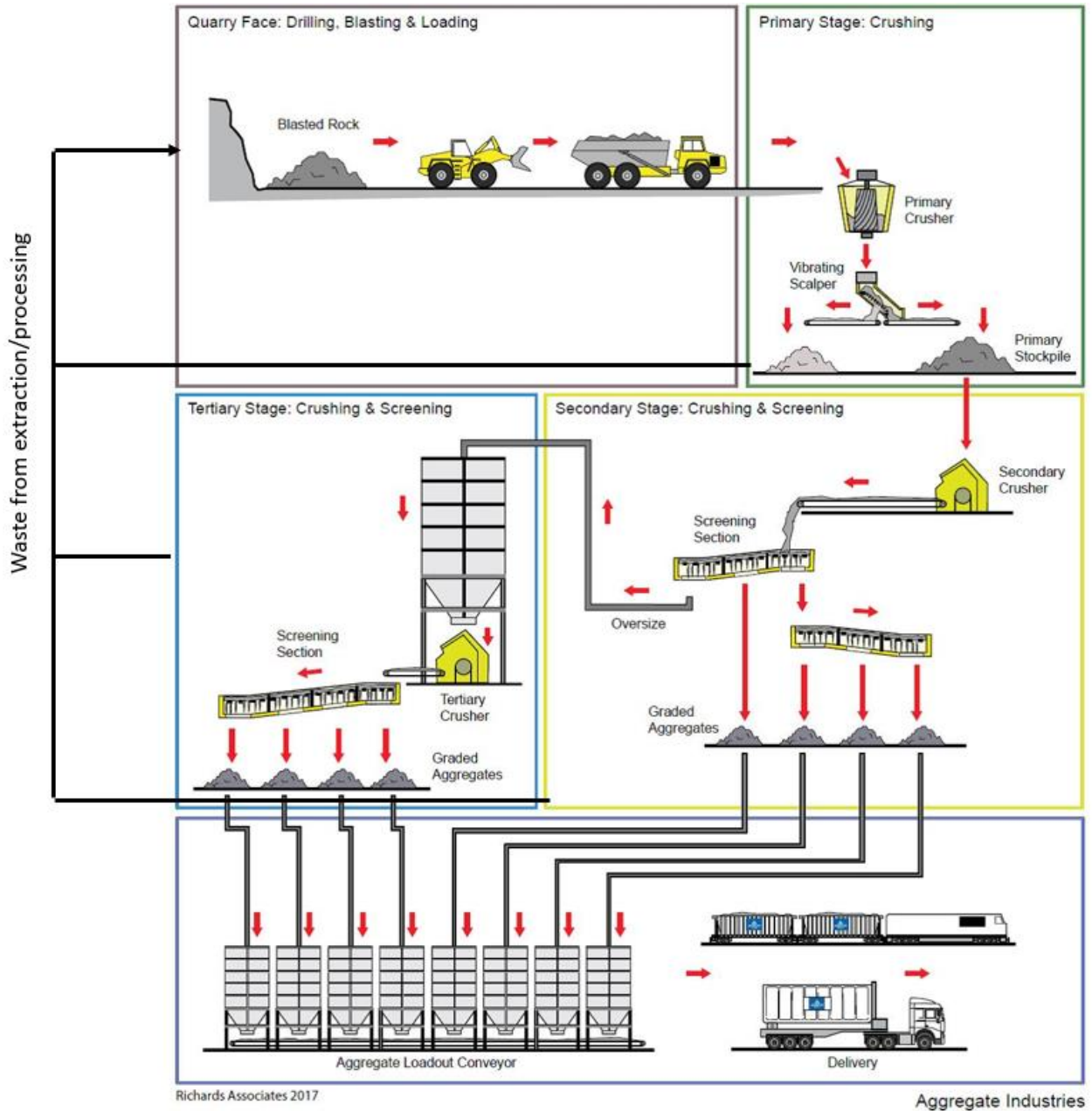
Material/Chemical Input	%
Granite aggregate	100

Manufacturing Process

The current EPD covers the following operations of 0/4 CRF (Crusher Run Fines) and 14mm granite aggregate:

1. **Quarrying and Primary Crushing**
The manufacturing process at Bardon Hill Quarry begins with drilling and blasting at the quarry face to break the rock. The blasted rock is then loaded onto trucks and transported to the primary crusher within the quarry. Here, the material undergoes initial crushing, and a vibrating scalper removes fines. The crushed material is subsequently stored in a primary stockpile.
2. **Secondary Crushing and Screening**
The material from the primary stockpile is fed into the secondary crusher for further size reduction. It then passes through a screening section to separate different size fractions, with oversized material being sent back for additional crushing.
3. **Tertiary Crushing and Final Screening**
In the tertiary stage, the material undergoes final crushing in the tertiary crusher. It is then screened again to produce graded aggregates of various sizes. This additional screening step for smaller aggregates requires slightly more energy consumption.
4. **Storage and Delivery**
The graded aggregates are transported via loadout conveyors to storage bins. The finished products are then loaded onto trucks and trains for delivery to customers. This process ensures high-quality, consistent aggregates suitable for various construction applications.

Process flow diagram



End of Life

Granite aggregate is used in bound and unbound applications. In this scenario, it's assumed as the granite aggregate is used in the bound applications such as concrete products which is sent to the waste processing facility after the demolition.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 tonne of Granite aggregate

System boundary

This is a cradle-to-gate with module C and D, LCA study that follows the modular design defined in EN15804:2012 + A2:2109, and the Life Cycle Assessment study has been performed in accordance with the requirements of BRE 2023 Product Category Rules (PN 514 Rev 3.1).

Data sources, quality and allocation

Specific primary data derived from the Aggregate Industries UK Ltd production process in the Bardon Hill Quarry, in Leicestershire (UK), have been modelled using LINA A2 software for the period (01/01/2022 to 31/12/2022). In accordance with the requirements of EN15804:2012 + A2:2019, the most current available data has been used. Secondary data has been obtained for all remaining upstream and downstream processes that are beyond the control of the manufacturer from the ecoinvent 3.8 database. 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 EN15804+A2:2019. 100% of the data has been allocated to the product. Site-wide values for energy and water have been derived from utility bills. Figures for raw and ancillary materials are based on actual usage.

Quality Level Geographical - Specific UK datasets have been selected from the ecoinvent LCI for this LCA. The quality of the geographical representativeness is therefore very good.

Technical Representativeness - Data from processes and products are under study. Same state of technology applied as defined in goal and scope (i.e. identical technology). Technical representativeness is therefore good.

Time Representativeness - There are less than 5 years between the ecoinvent LCI reference year and the time period for which LCA was undertaken. The quality level of time representativeness is Good as the background LCI datasets are based on the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

It's important to note that the LCA analysis uses electricity data from the GB National Grid, a detail that is integral to the system boundary of this assessment. This inclusion ensures that the environmental impacts associated with the use of electricity are accurately represented throughout the life cycle stages. According to Ecoinvent 3.8, the emissions factor for electricity generated from the UK grid (2022) is 0.239 kgCO₂eq./kWh.

Cut-off criteria - This study includes the quarrying and manufacturing of granite aggregates which includes A1-A3, and the end-of-life scenarios of this product (module C and D) but excludes emission to air, water, and soil and no packaging included in the LCA analysis. In the production process of granite aggregates, ancillary materials such as conveyor belts, screens, explosives, and maintenance materials for lorries may be required. In the LCA analysis, the explosive used during quarrying activities are included. However, the quantities of other potential ancillary materials have been excluded from the LCA analysis. During the quarrying and production process, any granite wastages (overburden) are put back into quarry. It is hard to measure the quantity of overburden put back to the quarry site, however in the LCA analysis it is typically assumed that 1% of the output has been considered in the analysis.

LCA Results

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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	9.15E-02	9.14E-02	7.79E-05	3.59E-05	2.11E-08	3.71E-04	5.89E-06
	Manufacturing	A3	5.11E+00	5.10E+00	1.12E-02	1.48E-03	9.58E-07	4.47E-02	3.01E-04
	Total	A1-3	5.20E+00	5.19E+00	1.13E-02	1.52E-03	9.79E-07	4.50E-02	3.07E-04
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.82E+00	3.82E+00	1.35E-03	3.81E-04	8.16E-07	3.97E-02	1.18E-04
	Disposal	C4	2.64E-01	2.63E-01	2.61E-04	2.49E-04	1.07E-07	2.48E-03	2.41E-05
Potential benefits and loads beyond the system	Reuse, recovery, recycling potential	D	-1.60E+01	-1.58E+01	-2.04E-01	-2.23E-02	-1.27E-06	-1.01E-01	-8.58E-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)

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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	1.12E-04	1.22E-03	3.74E-04	3.18E-07	1.38E+00	6.22E-03	7.89E-09
	Manufacturing	A3	1.90E-02	2.11E-01	5.70E-02	1.12E-05	8.22E+01	4.23E-01	1.13E-06
	Total	A1-3	1.91E-02	2.12E-01	5.74E-02	1.15E-05	8.36E+01	4.29E-01	1.14E-06
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.76E-02	1.92E-01	5.29E-02	1.96E-06	5.24E+01	1.21E-01	8.13E-06
	Disposal	C4	8.61E-04	9.42E-03	2.74E-03	6.01E-07	7.35E+00	3.37E-01	4.99E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.34E-02	-2.82E-01	-7.25E-02	-1.49E-04	2.32E+02	3.03E+01	-1.28E-06

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)

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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	7.10E-03	1.08E+00	3.49E-11	1.13E-09	9.49E-01
	Manufacturing	A3	1.03E+00	4.55E+01	1.69E-09	3.28E-08	2.23E+01
	Total	A1-3	1.04E+00	4.66E+01	1.72E-09	3.40E-08	2.32E+01
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.36E-01	3.06E+01	1.19E-09	2.22E-08	6.67E+00
	Disposal	C4	3.27E-02	4.64E+00	1.18E-10	3.05E-09	1.54E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.59E+00	-2.69E+02	-1.56E-08	-2.82E-07	-2.13E+02

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)

Parameters describing resource use, primary energy			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
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	1.95E-02	0.00E+00	1.95E-02	1.36E+00	0.00E+00	1.36E+00
	Manufacturing	A3	6.03E+00	8.45E-03	6.03E+00	8.85E+01	9.17E-02	8.86E+01
	Total	A1-3	6.05E+00	8.45E-03	6.05E+00	8.98E+01	9.17E-02	8.99E+01
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.93E-01	0.00E+00	2.93E-01	5.14E+01	0.00E+00	5.14E+01
	Disposal	C4	6.27E-02	0.00E+00	6.27E-02	7.22E+00	0.00E+00	7.22E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.18E+01	0.00E+00	-2.18E+01	-2.32E+02	0.00E+00	-2.32E+02

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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)

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	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.54E-04
	Manufacturing	A3	2.32E-02	2.03E-05	0.00E+00	1.39E-02
	Total	A1-3	2.32E-02	2.03E-05	0.00E+00	1.41E-02
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.99E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	7.88E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-7.16E-01

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)

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	1.52E-03	2.70E-02	9.35E-06
	Manufacturing	A3	1.19E-01	1.12E+01	5.88E-04
	Total	A1-3	1.21E-01	1.13E+01	5.98E-04
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.87E-02	4.83E-01	3.62E-04
	Disposal	C4	7.65E-03	1.08E-01	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.34E+00	-4.07E+01	-1.19E-03

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

LCA Results (continued)

Other environmental information describing output flows									
			CRU	MFR	MER	EEE	EET	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	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	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	5.42E-03	1.50E-07	3.70E-03	1.25E-02	0.00E+00	0.00E+00
	Total	A1-3	0.00E+00	5.42E-03	1.50E-07	3.70E-03	1.25E-02	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	6.84E-05	1.09E-06	0.00E+00	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	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	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EEE = Exported Energy Electricity
EET = Exported Energy Heat

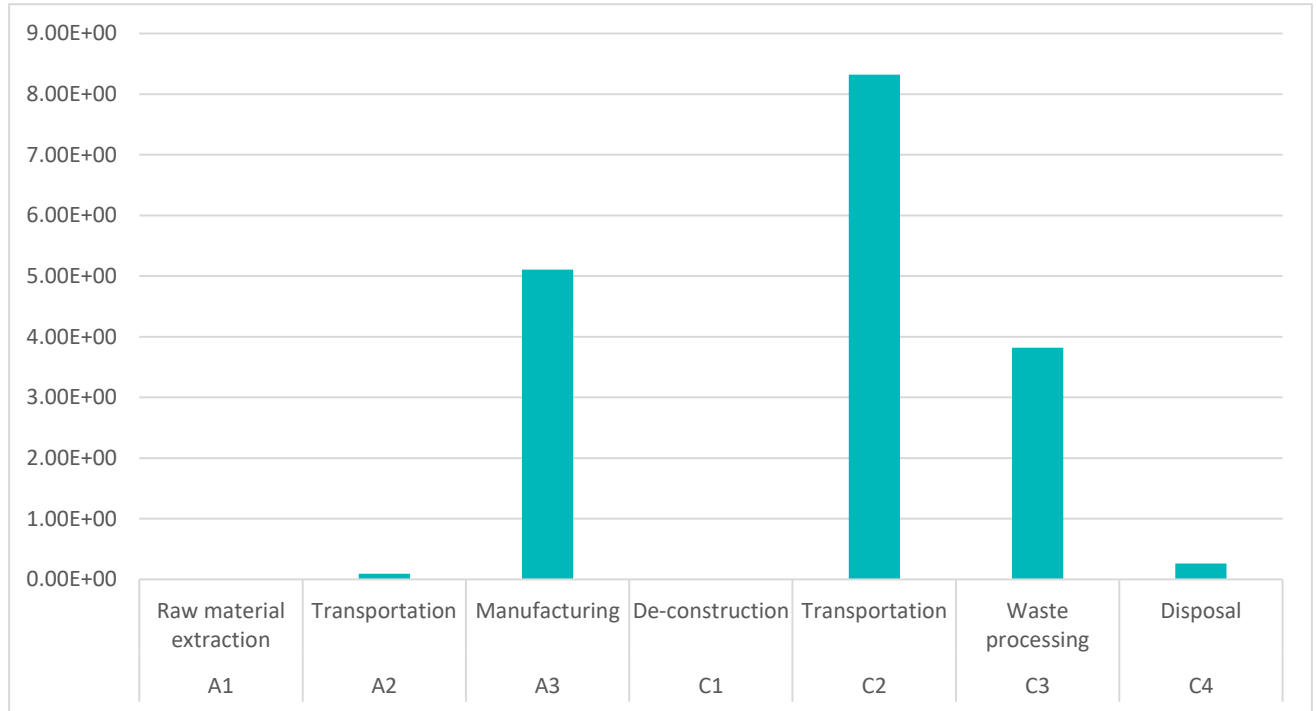
Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
C1 - Deconstruction	Granite aggregate is used in bound and unbound applications. In this scenario, it's assumed as the granite aggregate is used in the bound applications such as concrete products which is sent to the waste processing facility after the demolition. Based on the actual practice, the energy required for this process is negligible compared to the energy for demolishing the entire building. Therefore, no data is included for this module.		
C2 – End of life transport	A distance of 50 km by road has been modelled for Module C2, reflecting a typical industry practice for transporting materials from the demolition site to the factory. End-users of this EPD can use this information to calculate the impacts of a custom transport distance for Module C2 if it required.	km	50
C3 – Waste Processing	At the waste processing facility, the waste concrete in which the granite aggregates are embedded, will be crushed and used as the secondary material in the new system. According to the BRE 2023 Product Category Rules (PN 514 Rev3.1), at the end of life, 95% of aggregates are typically recycled.	Kg	950
C4 - Disposal	According to the BRE 2023 Product Category Rules (PN 514 Rev3.1), at the end of life, 5% of aggregates are typically landfilled	Kg	50
Module D – Benefits & Loads Beyond System	In accordance with the BRE 2023 Product Category Rules (PN 514 Rev3.1). This module demonstrates that 95% of the aggregate can be recycled for future production. Based on a unit of 1000 kg in this EPD, this equates to 950 kg of recyclable aggregate.		

Additional information

Interpretation

The bulk of the environmental impacts are attributed to the extraction/processing and waste treatment of granite aggregates, covered by information modules A1-A3 and C1-C4 of EN15804:2012+A2:2019. According to the percentage analysis of GWP, the module A3, the highest-emission stage in the aggregate production process at Bardon Hill and Module C3 (Recycling) have relatively high CO₂ emissions.



References

- BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A2:2019. London, BSI, 2019.
- BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (identical to ISO 14025:2006). London, BSI, 2010.
- BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.
- BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.
- BSI. Tests for mechanical and physical properties of aggregates – Part 6: Determination of particle density and water absorption. BS EN 1097-6. London, BSI, 2013.