

Statement of Verification

BREG EN EPD No.: 000389

Issue 02

This is to verify that the
Environmental Product Declaration
provided by:
Portland Stone Firms Ltd



is in accordance with the requirements of:
EN 15804:2012+A1:2013
and
BRE Global Scheme Document SD207

This declaration is for:
1m³ of Portland Stone

Company Address

99 Easton Street
Portland
Dorset
DT5 1BP



Portland Stone Firms

A handwritten signature in black ink, appearing to read 'E Baker'.

Signed for BRE Global Ltd

Emma Baker
Operator

05 October 2023
Date of this Issue

05 November 2021
Date of First Issue

04 November 2026
Expiry Date



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Environmental Product Declaration

EPD Number: 000389

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	LCA consultant/Tool
Portland Stone Firms Ltd 99 Easton Street Portland Dorset DT5 1BP	Andrew Dutfield / BRE LINA v2.0
Declared Unit	Applicability/Coverage
1m3 of Portland Stone cut and shaped into finished masonry, density 2300 kg/m3	Product Average.
EPD Type	Background database
Cradle to Gate	ecoinvent v3.2
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: Pat Hermon	
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+A1:2013. 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+A1:2013 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
<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 type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

99 Easton Street
 Portland
 Dorset
 DT5 1BP

Construction Product:

Product Description

Natural Portland Limestone is used in the construction of buildings. Typical finished products are copings, ashlar, paving, cornices, window surrounds, string courses, steps, etc. The Portland Stone range consists of the following different types:

- Broadcroft whitbed
- Coombefield whitbed
- Coombefield XE
- Coombefield shelly whitbed
- Perryfield whitbed
- Perryfield mid tier whitbed
- Perryfield basebed
- Perryfield shelly whitbed
- Perryfield roach

Technical Information

Property	Value, Unit
Density (BS EN 1936)	2300 kg/m ³
Open Porosity (BS EN 1936)	15.3-21.6%
Water absorption at atmospheric pressure (BS EN 13755)	4.6-7.6%
Water absorption by capillarity (EN 772-11)	22-152 g/m ² /s ^{0.5}
Compressive strength (EN 772-1)	37.9-90.9 MPa
Compressive strength after freeze thaw (56 cycles)(EN 772-1)	50.1-62.2 MPa
Thermal conductivity (BS EN 1745)	1.7-2.3 W(m.k) ⁻¹
Specific heat capacity (BE EN 1745)	1000 J/(kg.K)
Water vapour resistance factor dry (BS EN 1745)	200-250
Water vapour resistance factor wet (BS EN 1745)	150-200
Reaction to fire (BS EN 13501-1)	A1
Frost resistance (BS EN 12371)	56 cycles
Petrographic examination (BS EN 12407)	Oolitic or Bioclastic Limestone



Main Product Contents

Material/Chemical Input	%
Portland Stone	100

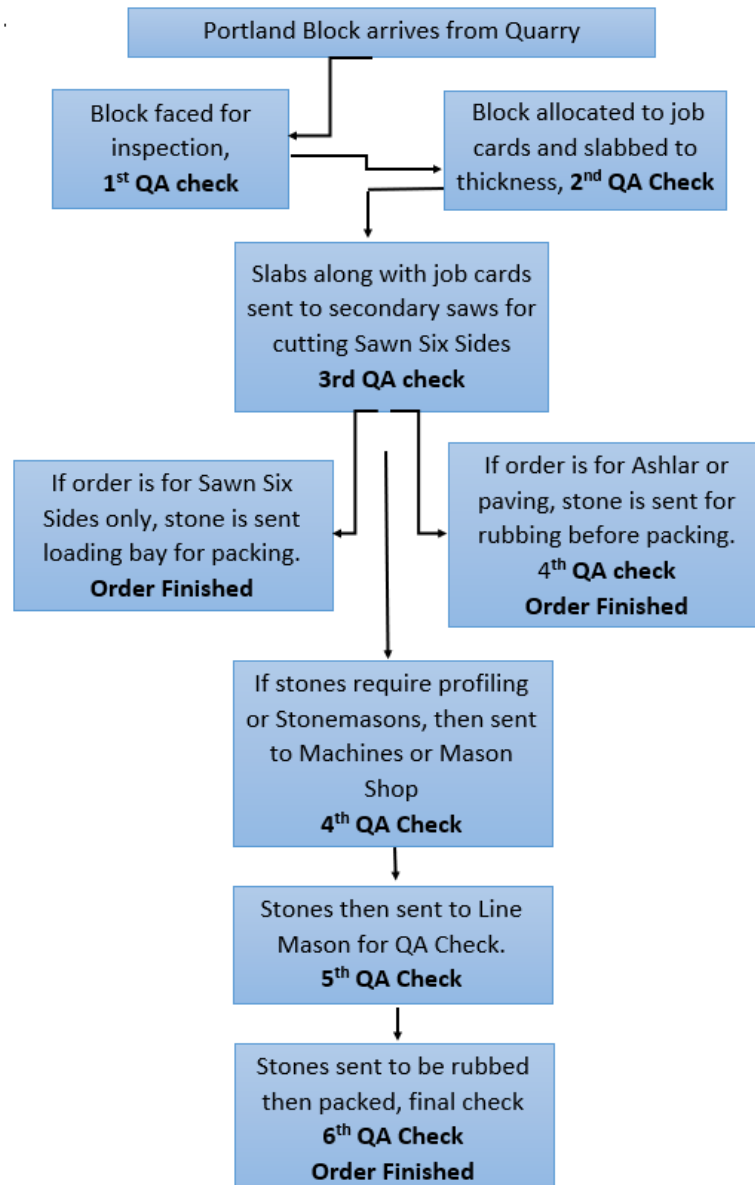
Manufacturing Process

Batches or similar sized stones are arranged for primary sawing. Blocks are selected for range and size then cut on the primary saws, quality checked and passed to secondary sawing. If the stone requires further processing, it is then sent to the planer machines or profilers to be shaped or grinding machines to have rebates, checks, profiles added. It may also need to go to the Banker Masons for hand finishing during which the stone undergoes several QA checks before completion.

The Ashlar plant is a specialist slabber, used for cutting stones of no more than 600mm bed height and 125mm thickness. Blocks are levelled, sawn, polished and honed. Stones then go to drilling or cutting of rebates or chamfered edges and again quality checked.

Finished stones are then palletised for transport.

Process flow diagram



Construction Installation

Generally the stone is used as a cladding material and fixed to a steel or concrete frame using stainless steel fixings, then pointed using a stone dust, white cement & lime mix.

Use Information

Once Portland Stone has been constructed, it will perform in its required function. Therefore no impacts are associated with the use stage of the Portland Stone over the lifetime of its installation.

End of Life

After demolition the stone is taken away and crushed to be used as a recycled aggregate.

Life Cycle Assessment Calculation Rules

Declared unit description

1m³ of Portland Stone cut and shaped into finished masonry, density 2300 kg/m³

System boundary

This is a cradle-to-gate LCA, reporting all production life cycle stages of modules A1 to A3 in accordance with EN 15804:2012+A1:2013.

Data sources, quality and allocation

This cradle to gate EPD covers all products manufactured by Portland Stone Firms Ltd and results represent an average of all product inputs and flows across the product range.

Portland Stone has a density of 2300 kg/3 and the declared unit is 1 m³ of stone. The data supplied relates to the Portland site and covers the period 1st January 2020 to 1st January 2021. The site does not manufacture other products in addition to Portland Stone and so total values for energy, water, waste and wastewater for the time period have been used. Energy usage includes all cutting, shaping and finishing processes.

Secondary data has been drawn from the BRE LINA database v2.0.79 and the background LCI datasets are based on ecoinvent v3.2.

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)	n/a
Fair	n/a	n/a	Less than 10 years of difference between the reference year according to the documentation, and the time period for which data are representative

The quality level of geographical and technical representativeness is Very Good. The quality level of time representativeness is Fair as the background LCI datasets are based on ecoinvent v3.2 which was compiled in 2015 and so there is less than 10 years between the reference year according to the documentation, and the time period for which data are representative.

Cut-off criteria

All raw materials and energy input to the manufacturing process have been included, except for direct emissions to air, water and soil, which are not measured. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items. Process energy, water use, production waste and general waste are included.

LCA Results

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

Parameters describing environmental impacts			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO ₂ equiv.	kg CFC 11 equiv.	kg SO ₂ equiv.	kg (PO ₄) ³⁻ equiv.	kg C ₂ H ₄ equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	6.17E+02	5.58E-05	4.22E+00	1.00E+00	3.33E-01	9.38E-04	1.18E+04

GWP = Global Warming Potential;
 ODP = Ozone Depletion Potential;
 AP = Acidification Potential for Soil and Water;
 EP = Eutrophication Potential;

POCP = Formation potential of tropospheric Ozone;
 ADPE = Abiotic Depletion Potential – Elements;
 ADPF = Abiotic Depletion Potential – Fossil Fuels;

Parameters describing resource use, primary energy			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	2.62E+03	3.69E-03	2.62E+03	1.52E+04	8.35E+01	1.53E+04

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	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	3.94E+00

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

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

Other environmental information describing waste categories						
			HWD	NHWD	RWD	
			kg	kg	kg	
Product stage	Raw material supply	A1	AGG	AGG	AGG	
	Transport	A2	AGG	AGG	AGG	
	Manufacturing	A3	AGG	AGG	AGG	
	Total (of product stage)	A1-3	2.82E+00	2.61E+01	8.22E-02	

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

Other environmental information describing output flows – at end of life						
			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00E+00	3.30E+02	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Interpretation

Portland Stone is the only input material and will therefore have the largest environmental impact. The other impacts come from energy usage, water usage and waste generation.

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly 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.