ENVIRONMENTAL PRODUCT DECLARATION

–

BGreen READY-MIX CONCRETE 40MPa, BG4020E80

Image © Tony Hewitt

In accordance with ISO 14025
and EN 15804:2012+A2:2019/AC:2021

Programme: The International EPD® System www.environdec.com
Programme operator: EPD International AB
Regional Programme: EPD Australasia www.epd-australasia.com

EPD Registration no. EPD-IES-0019767:001
Published: 31 Mar 2025 | **Valid to:** 31 Mar 2030
Geographical Scope: Western Australia

EPD of a single concrete product averaged across multiple locations.

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

BGreen Concrete

BGC Concrete

EPD INTERNATIONAL EPD SYSTEM

AUSTRALASIA EPD® ENVIRONMENTAL PRODUCT DECLARATION

ECO PLATFORM EPD VERIFIED

Image © Tony Hewitt

Contents

BGC Concrete

-

Building on 60 years of industry experience, BGC Concrete, a Western Australian owned company, is the largest manufacturer of structural and decorative concrete in the Perth metropolitan region.

At BGC Concrete, our vision is to continue the long history of producing and delivering high quality products and services to our customers in Western Australia. We have a commitment to our community and a passion for excellence in everything we do, whether it is a large multistorey building or a small residential slab, we can provide the highest quality products that will stand the test of time.

BGC Concrete operates out of eight (8) concrete batching plants across the Perth Metropolitan area, supported by a large transport fleet enabling the best possible service to all our customers that includes additional support services such as lighting towers, pump hire and concrete supply & install.

All BGC Concrete products are formulated and tested to meet strict Australian Standards, so customers can be assured that what we manufacture will make the grade.

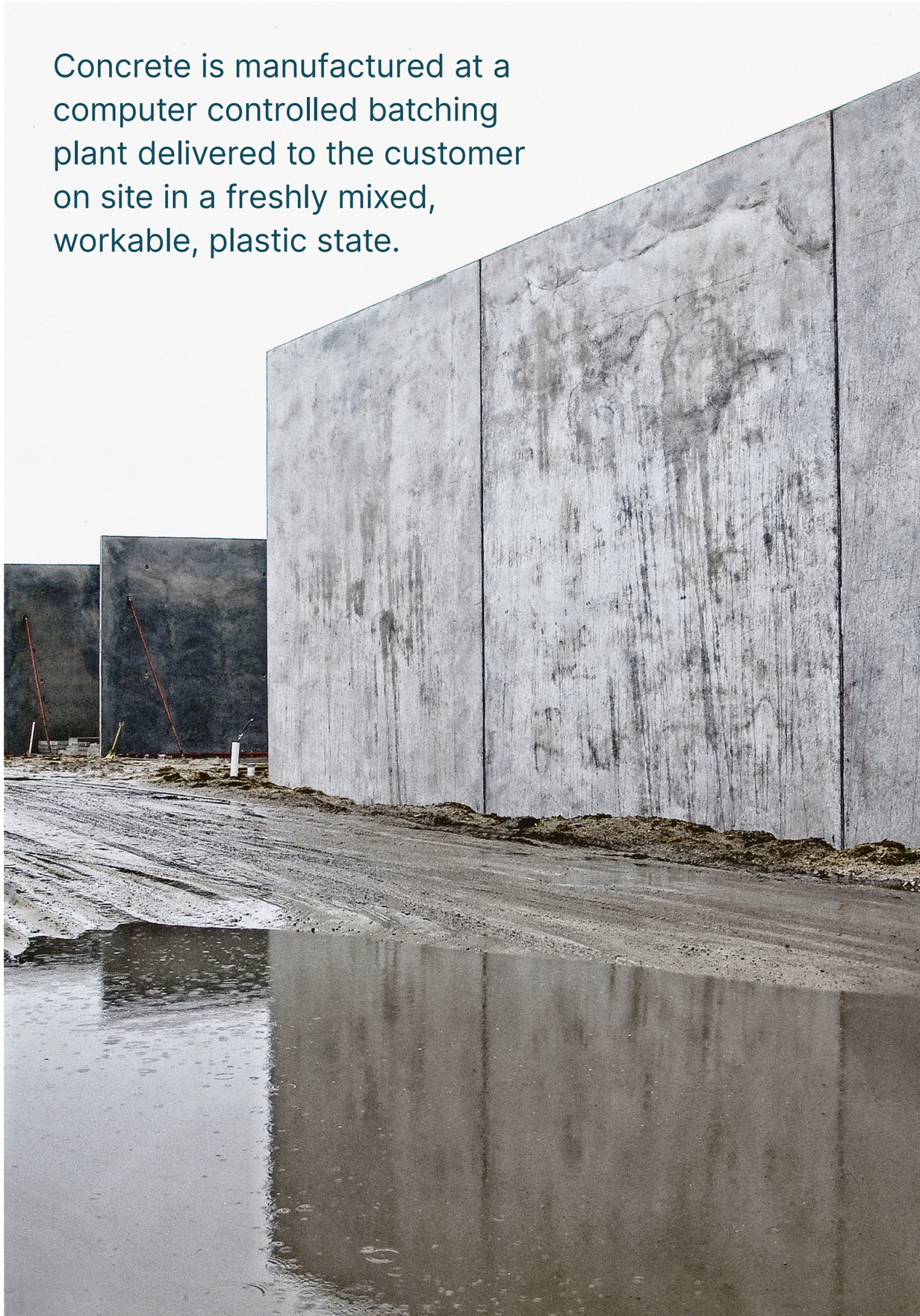


Image © Tony Hewitt

Ready-Mix Concrete

-

Our Locations

BGC Concrete operates out of eight (8) concrete batching plants across the Perth Metropolitan area, supported by a large transport fleet enabling the best possible service to all our customers.

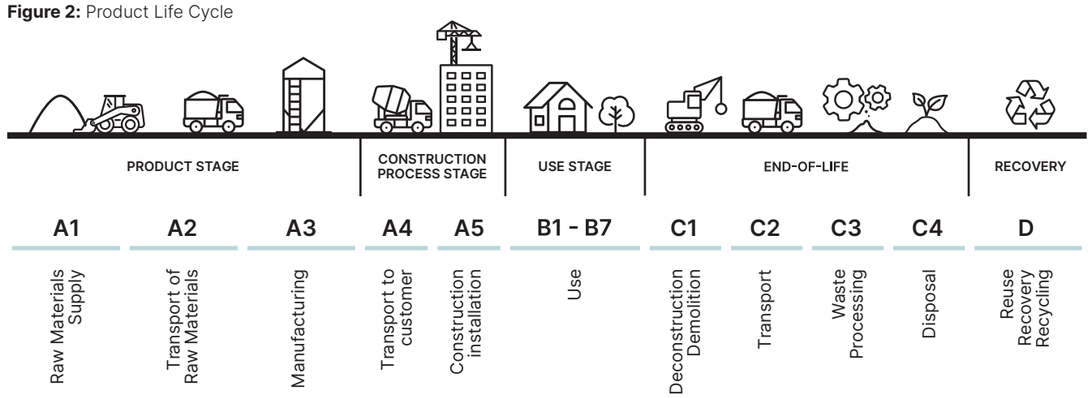
Figure 1: Location of BGC Concrete batching plants

Product Life Cycle

Creating an EPD is an extensive process based on a set of Product Category Rules (PCR) and a Life Cycle Assessment (LCA). Environmental data such as electricity and fuel consumption from the raw material process through to concrete production is evaluated, modelled and the reported through an independently verified EPD.

This EPD is based on a cradle-to-gate LCA with the end-of-life modules C1-C4 and D stages included. The construction process (modules A4-A5) and use stages (B1-B7) have not been modelled as these are best modelled at the building or infrastructure project level.

Figure 2: Product Life Cycle



Ready-Mix Concrete Production

The Ready-Mix Concrete mix covered by this EPD is manufactured with a combination of cement, coarse and fine aggregates, supplementary cementitious materials, admixtures, recycled, bore and town water that are sourced locally.

Ready-Mix Concrete is manufactured at a computer controlled batching plant and delivered to the customer on site in a freshly mixed, workable, plastic state via a truck mixer.

The product considered for this EPD falls into one class as outlined in AS1379, Normal (N) Class that is manufactured at BGC's eight concrete plants in Western Australia. Six plants in the Perth region have been grouped together and are presented using average values, while our products manufactured at the Mandurah and Wangara Plants have been excluded.

Product Composition

BGreen Concrete

The following table provides an overview of the BGreen Ready-Mix Concrete 40MPa, BG4020E80 in this EPD, composed of General Purpose Cement, Ground Granulated Blast Furnace Slag, Silica Fume, Aggregates, Sand, Water and Admixtures.

Table 1: BGreen Ready-Mix Concrete 40MPa, BG4020E80

Strength (MPa)	Mix Code	Mix Description	Applications / Intended Use
40	BG4020E80	40MPa (20@3days)140mm slump	Ground slabs, footings, & raft slabs

Content Declaration

A summary of the materials included in BGreen Concrete 40MPa, BG4020E80 are listed in Table 2.

Table 2: Product composition per declared unit

Product components	% (by weight)	Post-consumer material % (by weight)	Renewable material % (by weight)
General Purpose Cement	3-6	0	0
Silica Fume	0-2	0	0
Ground Granulated Blast Furnace Slag	10-16	0	0
Coarse Aggregates	20-50	0	0
Manufactured Sand	6-26	0	0
Natural Sand	18-27	0	0
Water	6-8	0	0
Admixtures	<0.3	0	0

BGreen Concrete 40MPa, BG4020E80 is delivered in bulk and therefore packaging materials are not relevant for the Ready-Mix concrete products considered in this EPD.

Our Ready-Mix concrete does not contain any biogenic carbon.

The product included in this EPD does not contain any substances of very high concern as defined by European REACH regulation in concentrations > 0.1% (m/m).

Technical Information

Technical Compliance

BGC Concrete does not simply manufacture concrete but develops innovative solutions based on local knowledge and experience. Our Concrete team consists of highly committed customer and quality focused members with over 80 years combined experience in all aspects of the construction industry.

BGC Concrete offers a special concrete portfolio, comprised of such products as world leading steel fibre reinforced flat floor concrete[1], lightweight concrete, architectural concrete, and pervious concrete to name just a few.

Climate change has motivated BGC Concrete and its customers to work towards a carbon neutral future, the publication of this EPD is an important step in this process. We support science-based research to drive innovation and our lab is working on the next generation of building materials that will have a lower environmental footprint and bring us closer to our goal of carbon neutral concrete.

BGC Concrete maintains an ISO 9001 certified Quality System to ensure we meet Australian Standards in the construction industry. Concrete is sampled and tested by a NATA certified laboratory to ensure compliance with AS1379-2007.

Industry Classification

The UN CPC and ANZSIC codes applicable to Ready-Mix concrete products are listed below:

UN CPC 375 - Articles of concrete, cement and plaster
ANZSIC 20330 - Concrete - Ready-Mix - except dry mix

Declared Unit

1 cubic metre (m^3) of Ready-Mix concrete, as ordered by our clients.

[1](The face companies' 2021 Golden Trowel Awards announced during world of concrete 2022)

System Boundary

This EPD covers the cradle-to-gate plus end-of-life life cycle stages (modules A1-A3, C1-C4, D). Construction and use stages have not been included as we cannot define a typical scenario for our range of concrete products. The modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation are shown in Table 3.

Table 3: Scope of EPD

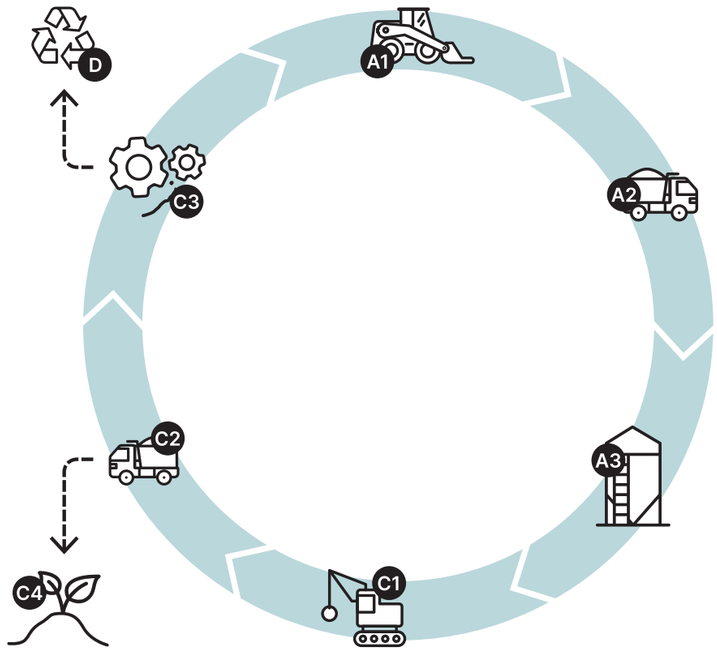
	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	✓	✓	✓	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	✓	✓	✓
Geography	AU, ID, JP	AU	AU	-	-	-	-	-	-	-	-	-	AU	AU	AU	AU	AU
Specific data used	87%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

✓: Module is declared
ND: Module is not declared

Product Stage

-

Figure 3: Product Stage (A1-A3) and End-of-Life (C1-C4 & D)



A4-A5 and B1-B7 are excluded from the EPD and therefore not shown in this figure.

Table 4: Quantity per m^3 of concrete

Processes	Quantity per m^3 of concrete	Unit
Collection process specified by type	2 372	kg collected separately
	0	kg collected with mixed construction waste
Transport from demolition site to recovery/disposal sites	50	km transport
Recovery system specified by type	0	kg for re-use
	1 914	kg for recycling
	0	kg for energy recovery
Disposal to landfill	458	kg product or material for final deposition
Assumptions for scenario development		63 MJ/tonne of diesel for the demolition process (C1) 38 MJ/tonne of diesel for the crushing process (C3) + 4 MJ/tonne of electricity for the crushing process (C3)

Product Stage (A1-A3)

Investigates the environmental impacts related to the manufacturing of concrete before it leaves the batch plant.

A1 Raw Material Supply
Extraction and processing of raw materials such as cement, fine and coarse aggregates.

To reduce our reliance on virgin materials, BGC Concrete has utilised ground granulated blast furnace slag (GGBFS) to displace clinker.

A2 Transportation
Transport of raw materials to the BGC Concrete Batch Plants.

A3 Manufacturing
Manufacturing of concrete begins with raw material handling, concrete batching, concrete mixing as well as the treatment of waste and water used in this process.

End-of-Life (C1-C4 & D)

Investigates the environmental impacts related to the concrete after it has reached the end of its useful life.

C1 Demolition
Demolition of concrete structure.

C2 Transport
Transport of the concrete waste for processing or to landfill.

C3 Waste Processing
Processing of concrete waste.

C4 Disposal
Landfill of concrete waste.

D Resource Recovery Stage
Reuse, recovery, and recycling potential of the product after its end-of-life.

Life Cycle Assessment (LCA) Methodology

-

Background Data

The BGreen product mix designs are current. BGC has collected and supplied the primary data for the Ready-Mix concrete plants based on the FY21 reporting period (1 July 2020 – 30 June 2021). BGC Cement and BGC Quarries provided data for the ingredients that they supply. BGC Cement data were updated in 2025. Background data (e.g. for other raw materials, energy and transport processes) have predominantly been sourced from AusLCI and the AusLCI shadow database (v1.42) (AusLCI 2023), as well as ecoinvent v3, and generic EPDs for admixtures. Background data used are either less than 10 years old or have been reviewed within this period.

Methodological choices have been applied in line with EN 15804; deviations have been recorded.

Allocation

The key processes that require allocation are:

- **Shared production of various concrete mixes:** overhead processes (i.e. energy use) for concrete production have been allocated to concrete mixes based on a volume basis (share in total m^3 of Ready-Mix concrete products).
- **Slag:** blast furnace slag (BFS) is a by-product from steel-making. We have used the AusLCI data for BFS ("blast furnace slag allocation, at steel plant/AU U"), which contain environmental impacts from pig iron production allocated to blast furnace slag.
- **Silica fume:** silica fume is a by-product of silicon metal production. Economic allocation is used to attribute impacts between silica fume and metallurgical grade silicon production.
- **Aggregates:** aggregates are produced through crushing of rock, which is graded in different sizes. The energy required for the crushing and screening does not differentiate between products. Therefore, impacts are allocated to products (e.g. crushed rock, manufactured sand) based on the mass of product. In effect, all aggregates have the same environmental profile.

Cut-off Criteria

The cut-off criteria applied are 1% of renewable and non-renewable primary energy usage and 1% of the total mass input of a process, while considering environmental impacts of small flows:

- The amount of packaging used for admixtures is well below the materiality cut-off and these materials have been excluded.

The contribution of capital goods (production equipment and infrastructure) - in the foreground and background systems - and personnel is excluded, as these processes are non-attributable and they contribute less than 10% to GWP-GHG.

Key Assumptions

The key choices and assumptions in the LCA are:

- Admixture data are based on EPDs for admixtures published by the European Federation of Concrete Admixture Associations (EFCA) (https://www.efca.info/efca-publications/environmental/).
- Silica fume receives some environmental impacts from metallurgical grade silicon production. This allocation decision has an effect on the environmental profile of products containing silica fume.
- Blast furnace slag receives some environmental impacts from pig iron production. This allocation decision has an effect on the environmental profile of products containing GGBFS.
- The end-of-life scenario is based on landfill and recycling rates for building and demolition materials in WA, as per the National Waste Report 2022 (NWR 2022).
- Electricity used in BGC's concrete production and BGC's aggregate production processes is modelled using a market-based approach.

Electricity

- Electricity in processes over which we have control (concrete batching and aggregate production) has been modelled using adjusted AusLCI data to represent the estimated residual electricity grid mix in Western Australia. This is done by removing renewables from the Australian Energy Statistics 2024 data (Table O.5). The GWP-GHG of the electricity is 0.79 kg CO_2e/ kWh. The proxy residual grid mix is made up of black coal (19.9%), natural gas (74.1%), and oil products (6.0%).
- Electricity used in other processes is typically modelled following a location-based approach.
- The selection of the electricity grid mix has a minor impact on the results. The "GWP-GHG (IPCC AR5)" results are provided using the above market-based electricity accounting approach as well as the location-based electricity accounting approach.

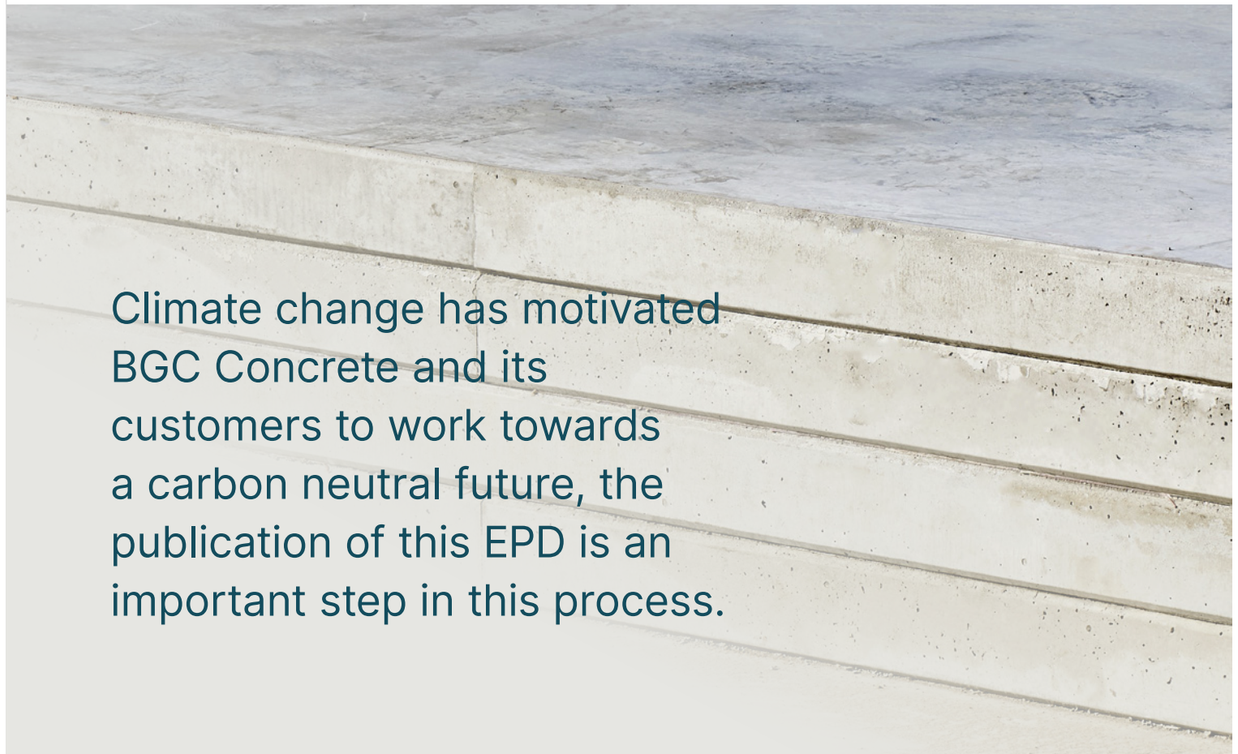


Image © Tony Hewitt

Environmental Impact Indicators

-

Environmental Impact Indicator Legend

The environmental indicators associated with impact categories, resource use, waste categories and output flows described in this EPD are summarised in the table below. All further tables will contain the abbreviation of the indicator for simplicity.

Table 5: Environmental impact indicators included in this EPD

Indicator	Abbreviation	Units
Mandatory Potential Environmental Impact indicators, in accordance to EN 15804:2012+A2:2019		
Global Warming Potential - total	GWP-total	kg CO_2-eq.
Global Warming Potential - fossil fuels	GWP-fossil	kg CO_2-eq.
Global Warming Potential - biogenic	GWP-biogenic	kg CO_2-eq.
Global Warming Potential - land use and land use change	GWP-luluc	kg CO_2-eq.
Depletion Potential of the Stratospheric Ozone Layer	ODP	kg CFC-11-eq.
Acidification potential	AP	mol H^+-eq.
Eutrophication potential - freshwater	EP-freshwater	kg P-eq.
Eutrophication potential - marine	EP-marine	kg N-eq.
Eutrophication potential - terrestrial	EP-terrestrial	mol N-eq.
Formation potential of tropospheric ozone	POCP	kg NMVOC-eq.
Abiotic depletion potential for non-fossil resources*	ADP-minerals & metals	kg Sb-eq.
Abiotic depletion potential for fossil resources*	ADP-fossil	MJ
Water (user) deprivation potential*	WDP	m^3world-eq.deprived
Additional Potential Environmental Impact indicators, in accordance to EN 15804:2012+A2:2019		
Global Warming Potential – Greenhouse gases	GWP-GHG	kg CO_2-eq.
Particulate Matter emissions	PM	Disease incidence
Ionising Radiation - human health**	IRP	kBq U-235-eq.
Eco-toxicity - freshwater*	ETP-fw	CTUe
Human toxicity potential - cancer effects*	HTP-c	CTUh
Human toxicity potential - non-cancer effects*	HTP-nc	CTUh
Land use related impacts / soil quality*	SQP	dimensionless
Additional GHG indicators		
Carbon footprint in line with IPCC AR5	GWP-GHG (IPCC AR5)	kg CO_2-eq.
Carbon footprint in line with IPCC AR5 (location-based)	GWP-GHG (IPCC AR5) location	kg CO_2-eq.

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.
** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

GWP-total is calculated using the European Union's Joint Research Centre's characterisation factors (CFs) based on the "EF 3.1 package" for CFs to be used in the EU's Product Environmental Footprint (PEF) framework. CFs listed by JRC are based on the IPCC AR6 method (IPCC 2021) and include indirect radiative forcing, which results in higher numerical Global Warming Potential (GWP) values than the CFs in the internationally accepted (IPCC 2013). The GWP-GHG indicator is identical to GWPtotal except that the CFs for biogenic CO2 are set to zero. The GWP-GHG indicator in PCR 2019:14 v1.3.4 differs from the GWP-GHG in earlier (pre v1.3) PCR 2019:14 versions. The "GWP-GHG (IPCC AR5)" indicator is determined using the IPCC AR5 GWPs with a 100-year time horizon (IPCC 2013). This indicator is aligned with Australia's greenhouse gas reporting frameworks.

Indicator	Abbreviation	Units
Resource use parameters		
Use of renewable primary energy excluding renewable primary energy	PERE	MJ
Use of renewable primary energy resources used as raw materials	PERM	MJ
Total use of renewable primary energy resources	PERT	MJ
Use of non-renewable primary energy excluding non-renewable primary	PENRE	MJ
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ
Total use of non-renewable primary energy resources	PENRT	MJ
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Net use of fresh water	FW	m^3
Waste Categories and Output Flows		
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Components for re-use	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy - electrical and thermal	EE	MJ
Additional Potential Environmental Impact indicators, in accordance to EN 15804:2012+A1:2013		
Global warming potential	GWP	kg CO_2-eq.
Ozone depletion potential	ODP	kg CFC-11-eq.
Acidification potential	AP	kg SO_2-eq.
Eutrophication potential	EP	kg PO_4^{3-}-eq.
Photochemical ozone creation potential	POCP	kg C_2H_4-eq.
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb-eq.
Abiotic depletion potential for fossil resources	ADPF	MJ

Environmental Impact Indicators

An introduction to each environmental impact indicator is provided below, along with the best known cause and effect.

Global Warming Potential (GWP)
Is due to the heat absorbed by greenhouse gases, causing the rise of the global temperature.

Photochemical Smog (POCP)
Is due to a mixture of pollutants which includes volatile organic compounds, particulates, nitrogen oxides and ozone. It's harmful to human health (causing lung irritation problems, coughing and wheezing) and the environment (damage to plants and crops).

Acidification Potential (AP)
Is due to emissions of acids, causing the degradation of materials such as metals, limestone and concrete, and damage to trees and life in lakes and rivers.

Abiotic Resource Depletion (ADP)
Is due to extraction and consumption of non-renewable resources such as oil, coal and metals, causing a decrease in future availability of functions supplied by these resources.

Eutrophication Potential (EP)
Is due to emissions of nutrients, causing blooms of algae. The degradation of dead algae consumes oxygen leading to the loss of plants and animals.

Ozone Depletion Potential (ODP)
Is due to emissions which destroy the ozone layer causing higher levels of UV light to reach earth which damages DNA in humans, animals and plants.

Water Deprivation Potential (WDP)
Is due to water availability versus demand. The less water remaining per area, the more likely another user will be deprived.

Life Cycle Assessment (LCA) Results

-

Environmental Profiles for BGreen Concrete 40MPa, BG4020E80 Perth region

The background Life Cycle Assessment serves as the foundation for this EPD. A Life Cycle Assessment analyses the environmental processes in the value chain of a product. It provides a comprehensive evaluation of all upstream (and sometimes downstream) material and energy inputs and outputs. The results have been calculated (based on the EFv3.1 set of characterisation factors) with SimaPro software v9.6.0.1. To separate the use of primary energy into energy used as raw material and energy used as energy carrier, Option B from Annex 3 of PCR 2019:14 has been applied.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding of threshold values, safety margins and/or risks.

Please consider the following mandatory statements when interpreting the results:

- ”The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks”.
- “The use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C is discouraged”.

Image © Tony Hewitt

Results

-

Table 6: Environmental indicators EN 15804+A2

Environmental Indicator	Units	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
Core Indicators							
GWP-total	kg CO_2-eq.	1.56E+02	1.22E+01	1.52E+01	7.86E+00	1.09E+00	-9.19E+00
GWP-fossil	kg CO_2-eq.	1.55E+02	1.22E+01	1.52E+01	7.85E+00	1.09E+00	-9.19E+00
GWP-biogenic	kg CO_2-eq.	1.22E+00	8.40E-04	9.38E-04	7.49E-03	8.76E-05	-3.44E-03
GWP-luluc	kg CO_2-eq.	2.02E-02	6.07E-06	7.17E-06	3.64E-06	5.26E-07	-1.62E-04
ODP	kg CFC-11-eq.	8.10E-06	2.02E-06	2.39E-06	9.92E-07	1.77E-07	-9.48E-07
AP	mol H^+-eq.	1.21E+00	1.39E-01	1.33E-01	2.16E-02	2.59E-03	-7.43E-02
EP-freshwater	kg P-eq.	3.04E-03	1.69E-06	9.12E-07	5.83E-06	1.48E-07	-1.44E-05
EP-marine	kg N-eq.	2.86E-01	6.06E-02	4.20E-02	3.85E-03	4.67E-04	-2.85E-02
EP-terrestrial	mol N-eq.	3.14E+00	6.64E-01	4.60E-01	4.20E-02	5.11E-03	-3.22E-01
POCP	kg NMVOC-eq.	7.95E-01	1.77E-01	1.12E-01	1.12E-02	1.37E-03	-8.32E-02
ADP-minerals & metals*	kg Sb-eq.	2.83E-06	1.49E-08	1.76E-08	1.95E-06	1.27E-09	-1.52E-07
ADP-fossil*	MJ	1.48E+03	1.77E+02	2.09E+02	1.12E+02	1.54E+01	-1.25E+02
WDP*	m^3world-eq.deprived	8.56E+01	1.12E+00	1.32E+00	1.15E+00	9.75E-02	-5.05E+00
Additional Indicators							
GWP-GHG	kg CO_2-eq.	1.55E+02	1.22E+01	1.52E+01	7.86E+00	1.09E+00	-9.19E+00
PM	Disease incidence	5.73E-06	3.69E-06	7.51E-07	1.44E-07	1.37E-08	-1.75E-06
IRP**	kBq U-235-eq.	1.77E-02	2.58E-04	3.04E-04	1.58E-03	2.25E-05	-1.77E-03
ETP-fw*	CTUe	2.65E+02	3.91E+01	4.61E+01	1.93E+01	3.37E+00	-1.93E+01
HTP-c*	CTUh	9.46E-09	4.90E-10	6.51E-11	1.65E-10	8.58E-12	-3.98E-10
HTP-nc*	CTUh	2.06E-07	2.61E-09	1.24E-09	1.07E-09	1.04E-10	-2.46E-09
SQP*	dimensionless	2.83E+02	8.49E-01	9.36E-01	2.13E+04	2.55E+01	-2.05E+02
Carbon footprint							
GWP-GHG (IPCC AR5)	kg CO_2-eq.	155	12.2	15.2	7.86	1.09	-9.18
GWP-GHG (IPCC AR5) location	kg CO_2-eq.	150	12.2	15.2	7.86	1.09	-8.39

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.
** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 7: EN 15804+A2 parameters

Parameter	Units	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
PERE	MJ_{NCV}	3.05E+01	2.74E-01	2.99E-01	1.94E+00	3.02E-02	-2.81E-01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	3.05E+01	2.74E-01	2.99E-01	1.94E+00	3.02E-02	-2.81E-01
PENRE	MJ_{NCV}	1.47E+03	1.77E+02	2.09E+02	1.12E+02	1.54E+01	-1.25E+02
PENRM	MJ_{NCV}	5.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ_{NCV}	1.47E+03	1.77E+02	2.09E+02	1.12E+02	1.54E+01	-1.25E+02
SM	kg	3.06E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	1.36E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	1.98E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m3	4.32E+00	2.56E-02	3.02E-02	3.99E-02	2.24E-03	-3.16E-01
HWD	kg	3.34E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	1.24E-01	8.10E-04	8.85E-04	5.48E-03	4.58E+02	-2.47E-03
RWD	kg	1.72E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	8.88E+01	0.00E+00	0.00E+00	1.91E+03	0.00E+00	-2.12E-02
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 8: Environmental indicators EN 15804+A1

Environmental Indicator	Units	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
GWP	kg CO_2-eq.	1.57E+02	1.22E+01	1.52E+01	7.84E+00	1.08E+00	-9.21E+00
ODP	kg CFC-11-eq.	6.41E-06	1.60E-06	1.89E-06	7.84E-07	1.40E-07	-7.49E-07
AP	kg SO_2-eq.	9.09E-01	9.90E-02	7.39E-02	1.37E-02	2.08E-03	-4.97E-02
EP	kg PO_4^{3-}-eq.	1.09E-01	2.04E-02	1.41E-02	1.34E-03	1.61E-04	-1.08E-02
POCP	kg C_2H_4-eq.	4.50E-02	9.70E-03	4.77E-03	7.62E-04	1.04E-04	-4.76E-03
ADPE	kg Sb-eq.	5.42E-06	1.51E-08	1.78E-08	1.95E-06	1.30E-09	-1.52E-07
ADPF	MJ_{NCV}	1.49E+03	1.66E+02	2.13E+02	1.19E+02	2.37E+01	-1.19E+02

Interpretation

-

An EPD presents quantified environmental data for a product based on information from a life cycle assessment (LCA) that has been developed voluntarily by a company to provide publicly accessible, quality assured and comparable information regarding the environmental performance of their products.

An EPD is one of many tools a procurement team can use to evaluate and choose a low-carbon product for their next construction project. EPDs are highly complex technical documents and the temptation to look at only one number such as Global Warming Potential (GWP) and award a contract to the supplier with the product with the lowest GWP is very appealing.

However, it is not so simple, and we encourage the reader to look further when comparing and evaluating alternative concrete mixes and suppliers because to make a true comparison, all the products must meet the same performance, function, and lifetime requirements. For example, concrete suppliers may only have access to historical data from life cycle databases rather than the ability to measure the true impacts of their operations with real data from their suppliers. BGC Concrete have used real data from their cement supplier, BGC Cement, rather than historical data from the Australian National Life Cycle Inventory Database and therefore BGC Concrete should not be compared directly with other Ready-Mix suppliers in the Perth metropolitan region when using alternate cement data.

EPDs are not intended to be used as a claim of environmental superiority. The BGC Concrete EPD provides us with a baseline, and we will continue to measure ourselves against this to track our performance. Furthermore, it can be used to compare the environmental performance of different BGC Concrete products based on varying cement blends and aggregate types.

Image © Tony Hewitt

Interpretation

-

Quick Use Guide

This compatibility chart has been created by BGC Concrete to assist with designing your next low carbon project, a structural engineer's guidance should always be sought. Please contact your local BGC Concrete representative for further details.

Application	BGreen Concrete (% GP Replacement)	Extra Guidance
Footing	65	Opportunity to maximise CO_2 reduction, for example use early in the building foundations (without hold down bolts)
Column	40	Opportunity to maximise CO_2 reduction if load times permit
Footpath	40	Meets design parameters
Suspended Slab	10	Small replacement of GP to meet stripping time with back propping
Cavity Fill	65	Opportunity to maximise CO_2 reduction
Ground Slab	20	Opportunity to reduce CO_2 emissions in winter without impacting on the finishing time; use accelerators to address initial set time.
Ground Slab	40	This should be the default in summer
Ground Slab	80	Opportunity to maximise CO_2 reduction savings if using floor coverings
Tilt up	10	Require same performance of GP cement but a slight reduction in GP cement should have minimal impact on the building programme
CFA Piling	80	Opportunity to maximise CO_2 reduction, for example use early in all piling applications
AFS Walls	40	Opportunity to maximise CO_2 reduction if load times permit
Spray Mix	65	Opportunity to maximise CO_2 reduction savings if using for non-structural applications eg finishing walls

Image © Tony Hewitt

Program Information and Verification

-

An Environmental Product Declaration (EPD) is a standardised way of quantifying the potential environmental impacts of a product or system. EPDs are produced according to a consistent set of rules – Product Category Rules (PCR) – that define the requirements within a given product category. These rules are a key part of ISO 14025 as they enable transparency and comparability between EPDs. This EPD provides cradle-to-gate plus end-of-life environmental indicators for BGreen Ready-Mix Concrete 40MPa BG4020E80.

This EPD is verified to be compliant with EN 15804+A2. EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/ functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

As the EPD owner, BGC Concrete has the sole ownership, liability, and responsibility for the EPD.

Declaration Owner	BGC Concrete	Address: Level 5, 67 Walters Dr Osborne Park, WA 6017 Web: www.bgcconcrete.com.au Phone: 08 6220 4700 Email: concrete@bgc.com.au
EPD Program Operator: (Regional programme)	EPD International AB	Box 210 60, SE-100 31 Stockholm, Sweden, E-mail: info@environdec.com
	EPD Australasia Limited	Address: 315a Hardy Street, Nelson 7010, New Zealand Web: www.epd-australasia.com Email: info@epd-australasia.com Phone: +61 2 8005 8206 (AU)
EPD Produced by:	Rob Rouwette, start2see	Address: 36 Renaissance Bvd, Mernda, Vic 3754, Australia Web: www.start2see.com.au Phone: +61 403 834 470 Email: rob.rouwette@start2see.com.au
Third PartyVerifier accredited or approved by: EPD Australasia Ltd.	Andrew D. Moore, Life Cycle Logic	Address: PO Box 571, Fremantle WA 6959, Australia Web: www.lifecyclelogic.com.au Phone: +61 4 2432 0057 Email: andrew@lifecyclelogic.com.au

EPD registration number:	EPD-IES-0019767:001
Published:	2025-03-31
Valid until:	2030-03-31 (5 years)
Reference year for data:	2020-07-01 – 2021-06-30
CEN standard EN 15804:2012+A2:2019 served as the core PCR	
PCR:	PCR 2019:14 Construction Products, Version 1.3.4, 2024-04-30 (valid until 2025-06-20) c-PCR-003: Product Category Rules (PCR) for Concrete and concrete elements (EN 16757) 2024-04-30 (valid until 2025-06-20)
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Most recent review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact
Independent verification of the declaration and data, according to ISO 14025:	☑ EPD verification by individual verifier
Procedure for follow-up of data during EPD validity involves third-party verifier:	◯ Yes ☑ No

References

AEPDP 2018
Australasian EPD Programme, Instructions of the Australasian EPD programme v3.0 - a regional annex to the general programme instructions of The International EPD® System, Version 3.0, 18 September 2018

AS 1379
AS 1379:2007 Specification and supply of concrete

AusLCI 2023
Australian Life Cycle Inventory database v 1.42, published by the Australian Life Cycle Assessment Society, 2023

EN 15804
EN 15804:2012+A2:2019, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, European Committee for Standardization (CEN), Brussels, October 2019

Environdec 2024a
Product category rules for Construction products (EN 15804:2012+A2:2019), registration number 2019:14, version 1.3.4, published on 30 April 2024

Environdec 2024b
c-PCR-003 Concrete and concrete elements (EN 16757:2022), Product category rules for concrete and concrete elements, version 30 April 2024

Environdec 2021
International EPD System, General Programme Instructions for the International EPD System, Version 4.0, 29 March 2021

ISO 14040
ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework. International Organization for Standardization, Geneva, Switzerland, 2006

ISO 14044
ISO14044:2006, Environmental management - Life cycle assessment - Requirements and guidelines. International Organization for Standardization, Geneva, Switzerland, 2006

ISO 14025
ISO14025:2006, Environmental labels and declarations - Type III environmental declarations - Principles and procedures. International Organization for Standardization, Geneva, Switzerland, 2006

NWR 2022
Blue Environment, National Waste Report 2022, prepared for The Department of Climate Change, Energy, the Environment and Water, Final version 1.2, 16 December 2022 (updated 10 February 2023)

Image © Tony Hewitt

Image © Tony Hewitt

Contact Information

Contact your BGC Concrete Representative today for more information

BGC Concrete

Phone: 08 6220 4700
Address: Whadjuk Country
Level 5, 67 Walters Drive, Osborne Park WA 6017
Web: www.bgcconcrete.com.au
Email: concrete@bgc.com.au