BORAL™

Boral Victoria Region
Pre-mix Concrete EPD

ENVIRONMENTAL PRODUCT DECLARATION

ECO PLATFORM EPD VERIFIED

In accordance with ISO 14025 and EN 15804

EPD Registration Number S-P-02341
Issued 21 Feb 2022 | Valid until 21 Feb 2027
Geographical Scope: VIC REGION.

AUSTRALASIA EPD
ENVIRONMENTAL PRODUCT DECLARATION

Contents

BORAL™

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, ISO 14040 and ISO 14044 as they enable transparency and comparability between EPDs. This EPD provides environmental indicators for Boral ENVISIA® Envirocrete®, Envirocrete® Plus, products for special applications and our normal class of pre-mix concrete products manufactured in Australia. This EPD is a "cradle-to-gate" declaration covering production of the concrete and its supply chain.

This EPD is verified to be compliant with EN 15804. EPD of construction products may not be comparable if they do not comply with EN 15804. EPDs within the same product category but from different programs or utilising different PCRs may not be comparable. Boral, as the EPD owner, has the sole ownership, liability and responsibility for the EPD.

Declaration Owner		
BORAL™	**Boral**	Address: 39 Delhi Road, North Ryde NSW 2113, Austrlia Web: www.boral.com.au Phone: +612 9220 6300
EPD Program Operator		
AUSTRALASIA EPD®	**EPD Australasia Limited**	Address: 315a Hardy Street Nelson 7010, New Zealand Web: www.epd-australasia.com Phone: 02 8005 8206 Email: info@epd-australasia.com
EPD Produced by		
START2SEE LIFE CYCLE ASSESSMENTS	**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 Party Verifier accredited or approved by EPD Australasia Ltd.		
Life Cycle Logic	**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

Program information and verification

EPD Version:	1.0
Reference year for data:	2018-01-01/2018-12-31

CEN standard EN 15804 served as the core PCR	
PCR	PCR 2012:01 Construction Products and Construction Services, Version 2.33, 2020-09-18 PCR 2012:01-SUB-PCR-G Concrete and concrete elements, 2020-09-18
PCR review was conducted by	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent verification of the declaration and data, according to ISO 14025	☐ EPD process certification (Internal) ☒ EPD verification (External)
Procedure for follow-up of data during EPD validity involved third-party verifier	☐ No ☒ Yes

The Stokehouse Melbourne.

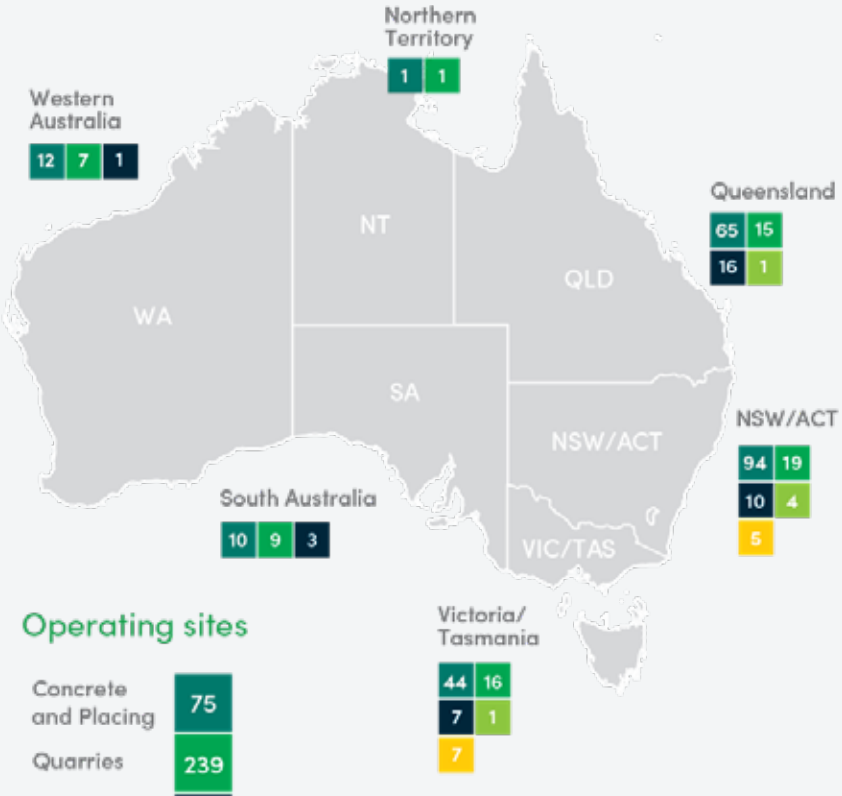
About Boral

Boral is the largest integrated construction materials company in Australia, with a leading position underpinned by strategically located quarry reserves and an extensive network of operating sites. We also manufacture and supply a range of building products.

Boral Concrete has over 230 pre-mix concrete plants around Australia producing a wide range of concrete mixes in metropolitan and country areas.

In Victoria, Boral Concrete supplies pre-mix concrete to all segments of the construction industry including infrastructure, social, commercial and residential construction.

This EPD covers the majority of the concrete products supplied from Boral plants in Victoria.



Operating sites

Concrete and Placing	75
Quarries	239
Asphalt	37
Cement	3
Recycling	6

1. At 1 December 2021. Includes transport, fly ash and R&D sites. Concrete and asphalt sites include mobile plants. Excludes mothballed plants, distribution and administration sites.
2. Includes cement manufacturing, grinding, bagging and lime plants in NSW, a clinker plant in Victoria and a clinker grinding Joint Venture in Queensland.

How we work

At Boral, we have a culture of 'working together' with a focus on Zero Harm Today. This ensures all of our employees, contractors, partners and communities in which we operate are free from harm, injury and illnesses.

Boral has a team of full-time Health, Safety, Environment and Quality specialists who operate across our integrated business, offering a single interface for safety communications and innovation across raw materials, logistics, operations and placement.

Innovation and technical capability

The Innovation Factory is Boral's in-house centre of excellence responsible for developing advanced cement and concrete solutions for our customers. Through consultation with our customers, the Innovation Factory is central to enabling transformation through innovative products at Boral.

Our focus on engagement and action is backed by intensive research and development through our dedicated and talented team who work in collaboration with many sections of the company to create a world of future generations will be proud of.

About Boral

Technical Services

As one of Australia's largest construction materials companies, Boral is committed to excellence, providing customers with quality products and reliable service. Our aim is to provide products backed up by specialised testing as well as extensive quality control testing and technical support.

To ensure we remain at the forefront, we constantly improve, develop and refine our products to maintain the high standards customers have come to expect.

Our production, technical and quality managers are committed to quality excellence in our manufacturing process. We have committed additional resources to research and we strive to develop whole-of-life solutions that offer a sustainable future. Our innovative products are designed in collaboration with our clients.

Not only are we the only Australian construction materials company to maintain a full-service construction materials laboratory in Australia, **Boral Materials Technical Services is also the largest facility of its kind in the country**, providing special and standard testing and product development services to Boral and our customers.

Boral maintains an ISO 9001-certified Quality System to ensure we conduct a regular regime of physical properties testing on all materials to certify they:

- Meet Australian Standards in the civil and structural construction industry;
- Comply with applicable legislation, regulations and industry standards;
- Meet project specifications; and
- Allow for continuous improvement.

Boral laboratory facilities have a quality management system that meets international standards and they are NATA-accredited for construction materials testing and chemical testing. These customer-focused services have earned Boral the reputation of a market leader in its approach.

The Stokehouse Melbourne.

About Boral

Sustainability at Boral

We recognise that our commitment and progress in managing sustainability outcomes is vital to our business and meeting the expectations of our customers.

We strive to:

- Deliver innovative, superior performing and more sustainable products and solutions that respond to a changing world and better meet our customers' needs
- Drive safety performance towards world's best practice and invest in our people to enable them to deliver on our strategy
- Reduce our environmental footprint and build our resilience to climate impacts, and
- Be a socially responsible member of the communities in which we operate.

In recent years, we have substantially reshaped our business to respond and adapt to changing commercial, technological, and environmental factors. We have invested in growing our lower carbon concrete products.

We are increasing our investment in innovation to enable us to expand our products and solutions that have a lower carbon footprint and thereby positively contribute to an effective transition to a lower carbon economy.

Boral's ENVISIA® and Envirocrete®/Plus products underpin this improved sustainable concrete range. We monitor and report on our sustainability performance to drive progress and continuous improvement and are responding to increasing expectations of our customers on the disclosure of our sustainability risks and opportunities.

VIC One Melbourne.

About Boral

Our commitment

Our overarching goal is to deliver Zero Harm Today. This means we target zero injuries to our people and seek to eliminate adverse environmental impacts. Where elimination is not possible, we seek to minimise any harmful effects from our operations. At an absolute minimum, this means complying with environmental legislation, regulations, standards and codes of practice.

- Reducing greenhouse gas emissions from our processes, operations and facilities.
- Reducing waste in all forms including through the efficient use of energy, conservation of water, minimising and recycling waste materials and energy, prevention of pollution, and effective use of virgin and recovered resources and supplemental materials.
- Protecting biodiversity values at and around our facilities.
- Openly and constructively engaging with communities surrounding our operations.

The Stokehouse Melbourne.

Geographical scope

VICTORIA (Overall Region)

The concrete plants considered for this Environmental Product Declaration comprise those in the state of Victoria, and NSW Riverina region. There are eight sub regions as listed below. Individual plants were assessed for life cycle assessment, and local surrounding similar raw material sources were included in the datasets. These regions, and modelled plants, including geographically nearby plants are listed in the following location maps.

- **Boral Concrete West Melbourne – Melbourne Metro region**
- **Boral Concrete Clayton – Melbourne South East Metro region**
- **Boral Concrete Waurn Ponds – Geelong/Bellarine region**
- **Boral Concrete Ballarat – Ballarat/Goldfields region**
- **Boral Concrete Bendigo – Loddon/Goldfields region**
- **Boral Concrete Shepparton – Goulburn/Central Murray region**
- **Boral Concrete Mildura – Mallee/Murray North region**
- **Boral Concrete Wodonga – Murray East/Hume region**

Red pins = plants that are being modelled in VIC EPD

Green pins = surrounding plants covered in VIC EPD scope

Orange pins = out of scope for the VIC EPD

Melbourne Metro
West Melbourne
Tullamarine
Deer Park
Somerton
Wollert
Sunbury
Melton

Geelong/ Bellarine Region
Waurn Ponds
Bacchus Marsh
Werribee

Loddon/ Goldfields
Bendigo

Goulburn/Central Murray Region
Shepparton
Tatura
Cobram
Numurkah
Nagambie
Kyabram
Moama
Mulwala
Finley
Benalla

South East Metro Region
Clayton
Dandenong
Carrum Downs
Cranbourne
Healesville
Montrose
Pakenham
Nunawading

Mallee/Murray North Region
Mildura
Swan Hill

Ballarat/Goldfields Region
Ballarat
Daylesford

Murray East/Hume Region
Wodonga

Declared products

Products considered for the Victorian environmental product declaration

The products considered for the EPD fall into three broad categories: normal class products, lower carbon concrete products and special concrete products. A brief description of each category is given below, followed by a full list of the products.

1) Normal Class Concrete Products

Normal class concrete products are suitable for general applications and designed to meet the requirements of AS 1379 (Specification and supply of concrete). The normal class concrete products have been grouped according to the cement blend they contain as follows.

Normal Class concrete category	Cementitious type
Normal Class GP blend	General Purpose (GP) cement
Normal Class GP/FA	General Purpose (GP) cement and fly ash (FA)
Normal Class GP/GGBFS	General Purpose (GP) cement and ground granulated blast furnace slag (GGBFS)

2) Lower Carbon Concrete Products

Lower carbon concrete products have been designed to have lower portland cement contents and low embodied carbon contents. The lower carbon concrete products have been further categorised according to their portland cement reduction and their performance, as per the sub categories below.

Lower Carbon Concrete Product	Portland cement reduction*	Typical properties
Envirocrete®	≥40%	• Complies with AS 1379
Envirocrete® 30%	≥30%	• Complies with AS 1379 • Applicable for Green Star projects (GBCA v1.3)
Envirocrete® 40%	≥40%	• Complies with AS 1379 • Applicable for Green Star projects (GBCA v1.3)
Envirocrete® Plus	≥45%	• Complies with AS 1379 • Applicable for Green Star projects • Improved early age strength and drying shrinkage compared to the Envirocrete® products
ENVISIA®	≥50%	• Complies with AS 1379 • Applicable for Green Star projects • Improved early age strength and drying shrinkage compared to the Envirocrete® and Envirocrete® Plus products

* The percentages indicate the typical portland cement reduction against default concrete mixes as defined in the Green Star and IS Rating tools by the Green Building Council of Australia (GBCA) and the Infrastructure Sustainability Council (ISC) respectively.

Declared products

Envirocrete® Concrete

Boral's Envirocrete® concrete is a lower carbon concrete product which complies with AS 1379. It contains supplementary cementitious materials to reduce the portland cement content and the embodied carbon content of the concrete and is suitable for projects targeting a lower carbon footprint.

For projects seeking Green Star points under the GBCA rating tool (v1.3) Envirocrete 30% and Envirocrete 40% are recommended as these products have been designed to meet the specific requirements of the rating tool.

For projects seeking a lower carbon footprint and have early age strength or lower shrinkage requirements Envirocrete plus or ENVISIA® concrete are recommended.

Envirocrete® Concrete (30% and 40%)

Boral's Envirocrete® 30% and Envirocrete 40% concrete are lower carbon concrete products which comply with AS 1379. They contain supplementary cementitious materials to reduce the portland cement content which reduces the embodied carbon content.

Envirocrete® 30% has a minimum portland cement reduction of 30% compared to the GBCA reference case and Envirocrete® 40% has a minimum portland cement reduction of 40% when compared to the GBCA reference case. Envirocrete® 30% and 40% are suitable for projects targeting a Green Star rating under the GBCA rating tool version 1.3 and where early age strength or low drying shrinkage is not required.

Envirocrete® Plus Concrete

Boral's Envirocrete® Plus concrete is a lower carbon concrete product which complies with AS 1379. It contains supplementary cementitious materials to reduce the portland cement and the minimum reduction in portland cement compared to the GBCA and ISCA reference case is 45%. Envirocrete® Plus also has enhanced engineering properties compared to the Envirocrete® range. The early age strength and drying shrinkage are superior to Envirocrete®.

ENVISIA® Concrete

Boral's ENVISIA® concrete is a lower carbon concrete product which complies with AS 1379 and has excellent engineering properties. It has a low portland cement content and a high supplementary cementitious content which results in reduced greenhouse gas emissions. ENVISIA® combines a proprietary cement technology (ZEP®) which gives it good early age strength, low shrinkage characteristics and excellent durability characteristics. An overview of the sustainability, durability, engineering and architectural properties are given over the page.

Declared products

Lower Carbon

- ENVISIA® has a low portland cement content and is suitable for projects seeking to maximise the number of green star points from concrete.
- ENVISIA® has a lower carbon content and is suitable for projects seeking compliance with the Green Building Council of Australia (GBCA) or the Infrastructure Sustainability Council (ISC).

Workability

- ENVISIA® can be placed, pumped and finished like conventional concrete

Superior Engineering properties

- ENVISIA® will achieve early-age strength equivalent to conventional concrete mixes with higher portland cement content (e.g post-tensioned and precast concrete.)
- ENVISIA® has 20 percent greater flexural strength compared to conventional concrete of the same grade.
- ENVISIA® achieves up to 50 percent reduction in shrinkage when compared to conventional sustainable concrete mixes. The low shrinkage of ENVISIA® will allow for more engineering options such as the design of larger slabs with fewer joints.

Superior Durability

- ENVISIA® provides improved durability, through greater protection to steel reinforcement against chloride induced corrosion.
- ENVISIA® has improved sulphate and acid resistance properties.
- ENVISIA® mitigates the potential expansion due to alkali aggregate reactivity.

Architectural Presence

- ENVISIA® can achieve a range of architectural benefits because of its off-form finish and lighter colour.
- ENVISIA®'s lighter colour will enhance the use of coloured oxides.

The Stokehouse Melbourne.

Declared products

Special concrete products

Boral's special concrete products have been designed to meet specific project requirements in addition to the requirements of AS 1379. They include products that have been designed for infrastructure projects, multi-residential buildings, commercial buildings and civil works.

Products covered by this environmental product declaration

The products covered in the EPD are listed below. The environmental impacts of products not referenced in the EPD can be provided on request. Boral is developing an environmental impact calculator allowing us to provide environmental profiles for virtually any mix design from any of our concrete plants in Australia. We intend to have the calculator independently verified in line with the same standards this EPD is based on, so that the results are of similar standing.

Lower Carbon Concrete Products

- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa
- ENVISIA® 65 MPa

- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

- ENVIROCRETE® 40% 20 MPa
- ENVIROCRETE® 40% 25 MPa
- ENVIROCRETE® 40% 32 MPa
- ENVIROCRETE® 40% 40 MPa
- ENVIROCRETE® 40% 50 MPa

- ENVIROCRETE® 30% 20 MPa
- ENVIROCRETE® 30% 25 MPa
- ENVIROCRETE® 30% 32 MPa
- ENVIROCRETE® 30% 40 MPa
- ENVIROCRETE® 30% 50 MPa

- ENVIROCRETE 20 MPa
- ENVIROCRETE 25 MPa
- ENVIROCRETE 32 MPa
- ENVIROCRETE 40 MPa
- ENVIROCRETE 50 MPa

Normal Class Concrete Products

- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

- NORMAL CLASS GP/FA BLEND 20 MPa
- NORMAL CLASS GP/FA BLEND 25 MPa
- NORMAL CLASS GP/FA BLEND 32 MPa
- NORMAL CLASS GP/FA BLEND 40 MPa
- NORMAL CLASS GP/FA BLEND 50 MPa

- NORMAL CLASS GP/GGBFS BLEND 20 MPa
- NORMAL CLASS GP/GGBFS BLEND 25 MPa
- NORMAL CLASS GP/GGBFS BLEND 32 MPa
- NORMAL CLASS GP/GGBFS BLEND 40 MPa
- NORMAL CLASS GP/GGBFS BLEND 50 MPa

Concrete for Vic Roads projects

- VR330 32 MPa GP/FA
- VR330 32 MPa GP/SLAG
- VR330 32 MPa GP
- VR400 40 MPa GP/FA
- VR400 40 MPa GP/SLAG
- VR400 40 MPa SHOTCRETE
- VR400 40 MPa TREMIE
- VR400 40 MPa TREMIE /CFA
- VR400 40 MPa TREMIE GP/SLAG
- VR400 40 MPa GP
- VR400 40 MPa TREMIE /CFA GP/SLAG
- VR450 50 MPa GP/SLAG
- VR450 50 MPa GP/FA
- VR450 50 MPa TREMIE
- VR450 50 MPa TREMIE /CFA
- VR450 50 MPa GP
- VR450 50 MPa TREMIE GP/SLAG
- VR450 50 MPa TREMIE /CFA GP/SLAG

Concrete for Special Applications

- HIGH SLUMP 20 MPa
- HIGH SLUMP 25 MPa
- HIGH SLUMP 32 MPa
- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa
- TREMIE 40 MPa
- TREMIE 50 MPa
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa
- SHOTCRETE 40 MPa
- STABILISED SAND 3%
- STABILISED SAND 5%
- KERB MACHINE 320KG/M^3
- KERB MACHINE 280KG/M^3
- NO FINES 4%

Pre-mix concrete production

Concrete production is the process of combining water, aggregates, cementitious binders and additives. These different 'ingredients' are mixed at a specialised facility known as a 'batching' plant.

A batching plant stores the ingredients in cement silos, aggregate bins and admixture tanks. The plants use calibrated weigh scales and flow meters to accurately weigh the ingredients which are then mixed in a mixer compliant with item C3 of AS 1379. Most concrete plants mix the concrete in a transit mixer (concrete truck) which then delivers the concrete to the project. However, some plants use a stationary mixer before discharging the mixed concrete into a concrete truck which then delivers the concrete to the project.

Depending on the proposed application of the final product, the concrete may contain other ingredients such as colour oxides and fibres and the production process may include heaters or chillers. Concrete production is time-sensitive, once the ingredients are mixed, workers must put the concrete in place before it loses workability.

The Stokehouse Melbourne.

ENVISIA® case study

BORAL™

Case Study
ENVISIA® Concrete

The Stokehouse Restaurant, St Kilda

Overview

Location
St Kilda, Victoria

Owner
Van Haandel Group

Builder
Lanskey Constructions

Engineer
Robert Simeoni

Architect
Bonnaci Group

Date
2014-2016

" The most exciting thing about the Stokehouse is the fact that we've managed to make it as environmentally friendly as we possibly can. "

Frank Van Haandel
Owner, Van Haandel Group

Boral helped lift the famed Stokehouse restaurant out of the ashes of a devastating fire in 2014 to become Australia's first 5 Star Green Star building of its kind. The owner's criteria for the new building included that it looked great and construction was as environmentally friendly as possible. It is now home to a refreshed and larger Stokehouse restaurant, casual dining space Pontoon and beachside fish and chip kiosk, Paper Fish.

Concrete Performance*

ENVISIA® 40 MPa

Portland cement reduction**	60%
4-day strength	28 MPa
7-day strength	33 MPa
28-day strength	43 MPa
Drying shrinkage at 56 days	280 m/s

ENVISIA® 50 MPa

Portland cement reduction**	60%
3-day strength	33 MPa
4-day strength	42 MPa
7-day strength	48 MPa
28-day strength	56 MPa
Drying shrinkage at 56 days	300 m/s

Outcomes

- The rebuild was at the forefront of low-carbon emission construction as the first Victorian venue to showcase Boral's ENVISIA® lower carbon concrete.
- ENVISIA® was used for the cantilevered slabs and exposed columns of the split level restaurant to reduce the volume of concrete and steel reinforcement required.
- ENVISIA® was chosen for its various characteristics including lower carbon, high early strength, durability, light colour, excellent off form finish and suitability for marine environments.
- ENVISIA® is expected to extend durability of the Stokehouse by more than 100 years.
- ENVISIA's® lower carbon credentials assisted our client to meet Government environmental and sustainability requirements for developing Crown land.

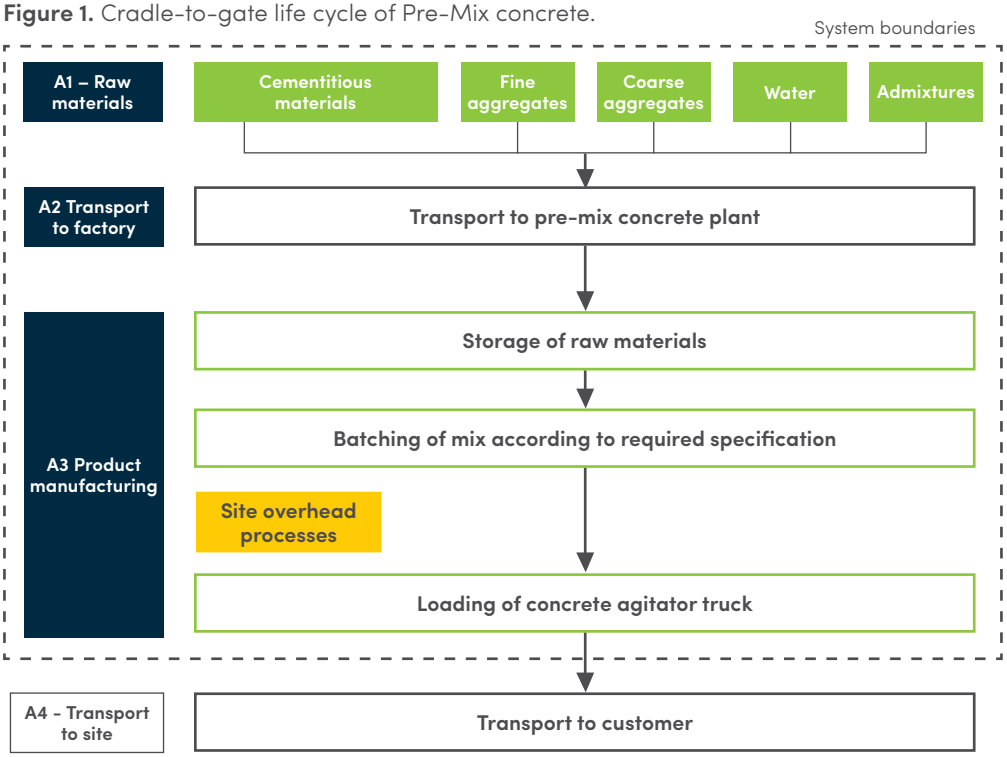
For more information please visit
www.boral.com.au/lower-carbon-concrete

* Mean results. **cf Green Building Council of Australia Mat 4 reference case. Boral, the Boral logo and Envisia are trade marks or registered trade marks of Boral Limited or one of its subsidiaries. 17645 09/21

Cradle-to-gate life cycle

This EPD covers the cradle-to-gate life cycle stages (A1-A3), as per diagram below. Downstream stages have not been included.

Figure 1. Cradle-to-gate life cycle of Pre-Mix concrete.



Raw Material Stage A1

All raw materials used in the production of Boral's normal class concrete, lower carbon concrete and special concrete products comply with the following standards as required by AS 3600 Concrete Structures (SA 2018) & AS 1379 Specification and Supply of Concrete (SA 2007/R2017):

- AS/NZS 3972: General purpose and blended cements (SA 2010)
- AS 3582.1 Supplementary cementitious materials
  Part 1: Fly Ash (SA 2016)
- AS 3582.2 Supplementary cementitious materials
  Part 2: Slag - Ground granulated blast furnace (SA 2016)
- AS 2758.1 Aggregates and rock for engineering purposes
  Part 1: Concrete Aggregates (SA 2014)
- AS 1478.1 Chemical admixtures for concrete, mortar and grout (SA 2000)

Cradle-to-gate life cycle

Transportation Stage A2

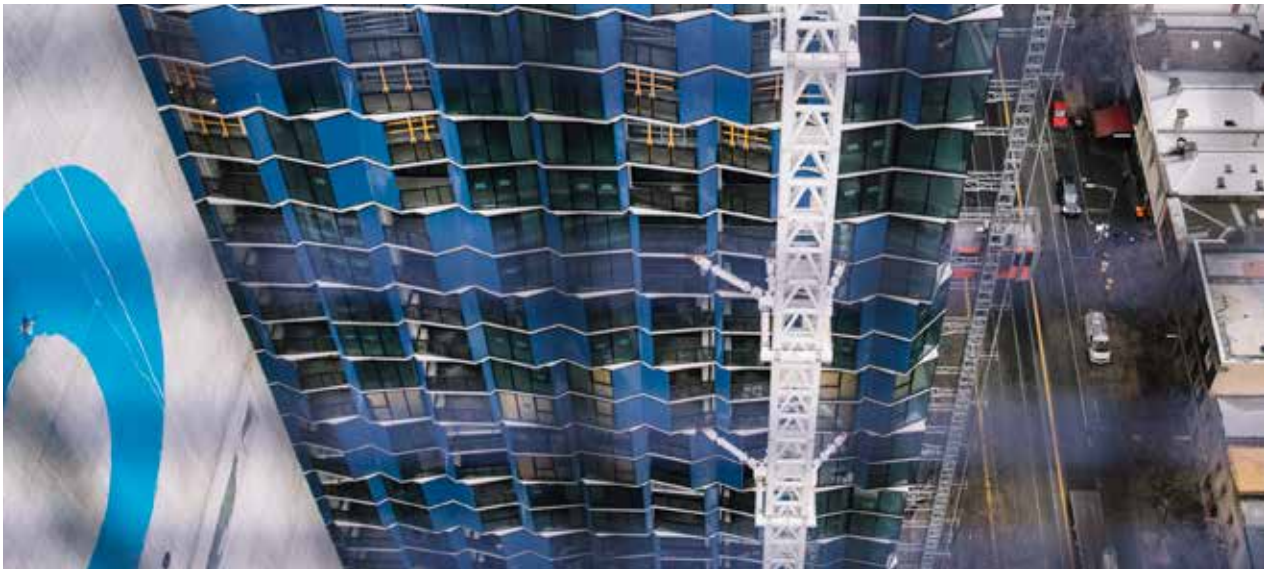
Raw materials are typically transported to our sites via articulated trucks. Coarse aggregates, manufactured sands and natural sands are sourced from our network of quarries, as well as third-party quarries. General purpose (GP) cement is supplied by Boral Cement from their facility in Waurn Ponds. Slag cement is supplied by a local supplier and fly ash is sourced from the Mount Piper power station. ZEP® additive and silica fume are mostly imported. Admixtures are sourced from locally based suppliers and transported using rigid trucks.

Table 1: Scope of EPD

Product Stage			Construction Stage		Use Stage							End-of-life Stage				Benefits beyond system boundary
RAW MATERIAL SUPPLY	TRANSPORT	MANUFACTURING	TRANSPORT	CONSTRUCTION-INSTALLATION PROCESS	USE	MAINTENANCE	REPAIR	REPLACEMENT	REFURBISHMENT	OPERATIONAL ENERGY USE	OPERATIONAL WATER USE	DECONSTRUCTION DEMOLITION	TRANSPORT	WASTE PROCESSING	DISPOSAL	REUSE, RECOVERY, RECYCLING POTENTIAL
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
			Scenario		Scenario							Scenario				
✔	✔	✔	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

✔ = module is included in this study MND = module is not declared*

* When a module is not accounted for, the stage is marked with "MND" (Module Not Declared). MND is used when we cannot define a typical scenario.



VIC One Melbourne.

Cradle-to-gate life cycle

Manufacturing Stage A3

The typical manufacturing process of Boral's normal class concrete, lower carbon concrete and special concrete products is by mixing concrete constituents comprising of cement and supplementary cementitious materials (SCM) (AS 3972/AS 3582.1,2), and fine/coarse aggregates (AS 2758.1), plus admixtures/additives (AS 1478.1) and water (AS 1379) directly in the truck referred to as the dry batch method, or in selected locations pre-mixing in a wet mix fashion, before delivery by agitator truck.

The entire process is covered under AS 1379 Specification and Supply of concrete and verified by third party under ISO9001. This manufacturing stage (A3) includes activities associated with sourcing and delivery of individual concrete constituents, up to the point of mixing at the batch plant, but not including delivery and placement of concrete at the project location. This is typically described as the Cradle (A1) to Gate (A3) life cycle.

Boral Concrete Agitator.

Life Cycle Assessment (LCA) Methodology

Background Data

Boral has supplied primary data from key quarries, cement production facilities and concrete production sites. Five concrete production sites (West Melbourne, Waurn Ponds, Ballarat, Shepparton and Bendigo) provided primary production data. All eight regions have provided mix design and supply chain data. The LCA shows that these sites are representative for key regions in Victoria. Data for admixtures have been sourced from EPDs published in December 2015 by EFCA (European Federation of Concrete Admixtures Associations) (EFCA 2015a-e).

Background data (e.g. for energy and transport processes, blast furnace slag and fly ash) have predominantly been sourced from AusLCI and the AusLCI shadow database.
The Victorian quarry data, cement production data and concrete production data have been collected for calendar year 2018. The vast majority of the environmental profiles of our products are based on life cycle data that are less than five years old. Background data used is less than 10 years old.

Methodological choices have been applied in line with EN 15804 (CEN 2013); deviations have been recorded.

Representative plants in each region

Boral operates **36** concrete plants in Victoria. This EPD covers a sub-section of our concrete plants located in eight key regions:

1. **WEST MELBOURNE FOR MELBOURNE METRO REGION (VIC)**
2. **CLAYTON FOR MELBOURNE SOUTH-EAST METRO REGION (VIC)**
3. **WAURN PONDS FOR GEELONG/BELLARINE REGION (VIC)**
4. **BALLARAT FOR BALLARAT/GOLDFIELDS REGION (VIC)**
5. **BENDIGO FOR LODDON/GOLDFIELDS REGION (VIC)**
6. **SHEPPARTON FOR GOULBURN/CENTRAL MURRAY REGION (VIC)**
7. **MILDURA FOR MALLEE/MURRAY NORTH REGION (VIC)**
8. **WODONGA FOR MURRAY EAST/HUME REGION (VIC)**

Our background LCA report shows that a single plant is representative for surrounding plants that have similar supply chains and mix designs.

Red pins = plants that are being modelled in VIC EPD scope

Life Cycle Assessment (LCA) Methodology

Allocation

The key material production processes that require allocation are:

- **Pre-mix concrete:** Boral manufactures a range of pre-mix concrete products at its sites. At each manufacturing site, energy use for concrete production has been allocated to the products based on a volume basis (total m^3 of pre-mix concrete products).
- **Cementitious binders:** Boral manufactures concrete using type GP cement inclusive of limestone mineral addition, ground granulated blast furnace slag (GGBFS) and fly ash (FA). Cement clinker is sourced from third parties and is milled into cement at the Boral Cement works at Waurn Ponds. Slag and fly ash are sourced from third parties.
- **BFS:** 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 impacts from pig iron production allocated to blast furnace slag.
- **Fly ash:** fly ash is a by-product from coal-fired power plants. We have used the AusLCI data for fly ash, in which all environmental impacts of the power plant are allocated to the main product: electricity. Fly ash has only received the burdens of transport to our sites.
- **Silica fume (micro-silica):** silica fume is a by-product of silicon metal or ferrosilicon alloys production. Economic allocation is used to attribute impacts between silica fume and ferrosilicon 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, aggregate production (including manufactured sand) has been allocated based on the mass of product.

The allocation assumptions were checked using sensitivity analyses, which showed that the allocation of fly ash can have an impact on the LCA results if impacts of electricity production are assigned to fly ash.

Cut-off Criteria

- The contribution of capital goods (production equipment and infrastructure) and personnel is outside the scope of the LCA, in line with the PCR (Environdec 2020a).
- The amount of packaging used for admixtures is well below the materiality cut-off. Nonetheless, packaging materials and quantities are included in the admixture EPD data.

Key Assumptions

- Admixture data are based on generic EPDs that are valid for a range of different chemicals, including the admixtures used by Boral. No EPD has been published for Viscosity Modifying Admixtures (VMA); we have used an average of the five admixture EPDs published by EFCA as a proxy.
- Fly ash is considered a by-product of electricity generation that comes without prior environmental impacts. This allocation decision can have a significant effect on the environmental profile of products that use fly ash.
- Blast furnace slag receives some environmental impacts from pig iron production. This allocation decision has an effect on the environmental profile of products, Enviroment® cement or ground granulated blast furnace slag (GGBFS).
- Water consumption is not measured consistently across quarries. We have used AusLCI water consumption data per tonne of coarse and fine aggregates instead.

Product Composition

Content declaration (% by weight)

Table 2. VIC product compositions

Constituent	Normal class GP blend	Normal class GP/FA	Normal class GP/GGBFS blend	Envirocrete®
General Purpose cement	9–19%	8–18%	8–17%	6–18%
Ground granulated blast furnace slag	–	–	1–4%	1–9%
Fly ash	–	2–5%	–	–
Silica fume	–	–	–	–
Coarse aggregate	40–50%	40–50%	40–50%	40–50%
Manufactured sand	0–20%	0–20%	0–7%	0–20%
Natural sand	22–41%	21–38%	21–41%	22–41%
Admixtures	<0.2%	<0.2%	<0.2%	<0.2%
Water	7–9%	6–9%	6–9%	6–9%

Table 2. Continued VIC product compositions

Constituent	Envirocrete® Plus*	ENVISIA®*	VIC ROADS	Special
General Purpose cement	6–11%	4–11%	7–16%	3–17%
Ground granulated blast furnace slag	5–9%	6–12%	0–11%	0–12%
Fly ash	–	–	0–5%	–
Silica fume	–	–	0–2%	0–2%
Coarse aggregate	40–50%	35–50%	30–50%	0–95%
Manufactured sand	0–20%	0–20%	–	0–41%
Natural sand	22–40%	22–40%	25–44%	0–84%
Admixtures	<0.4%	<0.8%	<0.4%	<0.3%
Water	6–8%	6–8%	7–9%	2–13%

The products as supplied are non-hazardous. The products included in this EPD do not contain any substances of very high concern as defined by European REACH regulation in concentrations >0.1% (m/m). *May include Zep® technology

Declared Unit

The background LCA serves as the foundation for this EPD. An LCA 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 are provided for a range of environmental impact categories, in line with EN 15804 (CEN 2013).

Pre-mix concrete is available in various strength grades and with characteristics that are specifically designed for each application. The declared unit that covers all of the products is: 1 cubic metre (m^3) of pre-mix concrete (as ordered by client) with a given strength grade and identifying characteristics. This declared unit has been adapted from the sub-PCR (Environdec 2020b).

All results are presented per declared unit and cover the A1-A3 life cycle stages (cradle-to-gate).

The product code for pre-mix concrete is UN CPC 375 (Articles of concrete, cement and plaster) and ANZSIC 20330 (Concrete – ready mixed – except dry mix).

VIC One Melbourne.

Environmental indicators

Table 3. Impact categories included in this assessment

Impact category	Acronym	Unit
Global Warming Potential	GWP	kg CO_2 equivalents
Ozone Depletion Potential	ODP	kg CFC-11 equivalents
Acidification Potential of soil and water	AP	kg SO_2 equivalents
Eutrophication Potential	EP	kg PO_4^{3-} equivalents
Photochemical Ozone Creation Potential	POCP	kg C_2H_4 equivalents
Abiotic Depletion Potential for Mineral Elements	ADPE	kg Sb equivalents
Abiotic Depletion Potential for Fossil Fuels	ADPF	MJ

Table 4: Parameters describing resource use, waste and output flows

Resource use	Acronym	Unit
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ_{NCV}
Use of renewable primary energy resources used as raw materials	PERM	MJ_{NCV}
Total use of renewable primary energy resources	PERT	MJ_{NCV}
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ_{NCV}
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ_{NCV}
Total use of non-renewable primary energy resources	PENRT	MJ_{NCV}
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ_{NCV}
Use of non-renewable secondary fuels	NRSF	MJ_{NCV}
Use of net fresh water	FW	m^3
Waste categories		
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Output flows		
Components for re-use	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy	EE	MJ

Environmental profiles

The cradle-to-gate (module A1-A3) environmental profiles and environmental parameters of each product group are expressed per m^3 of pre-mix concrete (volume as ordered by the client).

LIMITATIONS

The results of this study and the EPD are valid for Boral products only. Products from other manufacturers will likely have different impacts due to differences in mix designs, supply chains and manufacturing processes. The main limitations of the LCA results are found in the parameter results, which are highly dependent on background data.

The environmental parameters are based on the life cycle inventory. There is some ambiguity around their presentation, and issues to note include:

- Hazardous waste disposal (HWD) is derived from background LCI data.
- Non-hazardous waste disposal (NHWD) is derived from background LCI data.
- Radioactive waste disposal (RWD) is derived from background LCI data. Radioactive waste is only coming through the EPD data for admixtures, unless the life cycle contains clinker manufactured overseas.

VARIATION (A1-A3) PER IMPACT CATEGORY

The results of the LCA are based on data from one representative plant for each of the regions. The environmental profiles of concrete manufactured at other plants in the same region are largely similar, with variations mainly due to differences in transport distances for raw materials supplied to the concrete plant. The largest variation for the concrete mixes* is found in 20 MPa ENVISIA®, as this is the concrete product with the smallest footprint and the largest contribution from transport. The variation across included sites for other concrete products is considerably lower, and most mandatory indicators stay well within the ±10% range as required by the PCR (Environdec 2020a). We have analysed the maximum variation (caused by differences in transport) for each region:

- **Melbourne Metro:** the variations for all concrete mixes and plants covered in the Melbourne Metro region stay within ±10% of the reported values for West Melbourne, except for ozone layer depletion (31%), photochemical oxidant creation (28%) and abiotic depletion (fossil fuels) (12%) impacts, which are generally lower than for the modelled plant.
- **Melbourne South East Metro:** the variations for all concrete mixes and plants covered in the Melbourne South East Metro region stay within ±10% of the reported values for Clayton.
- **Geelong/Bellarine:** the variations for all concrete mixes and plants covered in the Geelong/Bellarine region stay within ±10% of the reported values for Waurn Ponds, except for ozone layer depletion (17%) and photochemical oxidant creation (14%).
- **Ballarat/Goldfields:** the variations for all concrete mixes and plants covered in the Ballarat/Goldfields region stay within ±10% of the reported values for Ballarat.
- **Loddon/Goldfields:** Bendigo is the only plant in this region, and therefore variation due to grouping is not relevant.
- **Goulburn/Central Murray:** the variations for all concrete mixes and plants covered in the Goulburn/Central Murray region stay within ±10% of the reported values for Shepparton, except for ozone layer depletion (35%), eutrophication (14%), photochemical oxidant creation (30%) and abiotic depletion (fossil fuels) (15%) impacts.
- **Mallee/Murray North:** The impacts at the modelled plant (Mildura) are more conservative than for the regional plant (Swan Hill), due to larger transport of raw material. The impacts in Swan Hill can be significantly lower than the stated values, by up to 14% for climate change, 31% for ozone layer depletion,13% for acidification, 17% for eutrophication, 28% for photochemical oxidant creation, and 18% for abiotic depletion (fossil fuels).
- **Murray East/Hume Region:** Wodonga is the only plant in this region, and therefore variation due to grouping is not relevant.

* The variation for stabilised sand and no fines products is much more dependent on transport of aggregates and exceeds 10% in most cases. Specific data should be sought from Boral if these mixes are important for your footprint and are sourced from plants other than the representative plant that has been modelled.

Melbourne Metro Region

Environmental profiles and parameters.

Product table list
Melbourne Metro

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower Carbon Concrete Products

Table No. 1 and 2
- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa
- ENVISIA® 65 MPa

Table No. 3 and 4
- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 6
- ENVIROCRETE® 40% 20 MPa
- ENVIROCRETE® 40% 25 MPa
- ENVIROCRETE® 40% 32 MPa
- ENVIROCRETE® 40% 40 MPa
- ENVIROCRETE® 40% 50 MPa

Table No. 7 and 8
- ENVIROCRETE® 30% 20 MPa
- ENVIROCRETE® 30% 25 MPa
- ENVIROCRETE® 30% 32 MPa
- ENVIROCRETE® 30% 40 MPa
- ENVIROCRETE® 30% 50 MPa

Table No. 9 and 10
- ENVIROCRETE 20 MPa
- ENVIROCRETE 25 MPa
- ENVIROCRETE 32 MPa
- ENVIROCRETE 40 MPa
- ENVIROCRETE 50 MPa

Normal Class Concrete Products

Table No. 11 and 12
- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 13 and 14
- NORMAL CLASS GP/FA BLEND 20 MPa
- NORMAL CLASS GP/FA BLEND 25 MPa
- NORMAL CLASS GP/FA BLEND 32 MPa
- NORMAL CLASS GP/FA BLEND 40 MPa
- NORMAL CLASS GP/FA BLEND 50 MPa

Table No. 15 and 16
- NORMAL CLASS GP/GGBFS BLEND 20 MPa
- NORMAL CLASS GP/GGBFS BLEND 25 MPa
- NORMAL CLASS GP/GGBFS BLEND 32 MPa
- NORMAL CLASS GP/GGBFS BLEND 40 MPa
- NORMAL CLASS GP/GGBFS BLEND 50 MPa

Vic Roads Concrete Products

Table No. 17 and 18
- VR330 32 MPa GP/FA
- VR330 32 MPa GP/SLAG
- VR400 40 MPa GP/FA
- VR400 40 MPa GP/SLAG
- VR400 40 MPa TREMIE GP/SLAG
- VR400 40 MPa TREMIE/CFA GP/SLAG

Table No. 19 and 20
- VR400 40 MPa SHOTCRETE
- VR450 50 MPa GP/SLAG
- VR450 50 MPa GP/FA
- VR450 50 MPa TREMIE GP/SLAG
- VR450 50 MPa TREMIE/CFA GP/SLAG

Concrete Products for Special Applications

Table No. 21 and 22
- HIGH SLUMP 20 MPa
- HIGH SLUMP 25 MPa
- HIGH SLUMP 32 MPa
- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 23 and 24
- TREMIE 40 MPa
- TREMIE 50 MPa
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa
- SHOTCRETE 40 MPa

Table No. 25 and 26
- STABILISED SAND 3%
- STABILISED SAND 5%
- KERB MACHINE 320KG/M^3
- KERB MACHINE 280KG/M^3
- NO FINES 4%

Melbourne Metro Region

GWP SUMMARY (kg CO_2 eq/m^3)

ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa	
165	178	205	282	318	383	
ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa		
191	214	232	270	338		
ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa		
215	240	270	322	397		
ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa		
244	272	307	369	454		
ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa		
200	227	240	288	364		
Normal GP blend 20 MPa	Normal GP blend 25 MPa	Normal GP blend 32 MPa	Normal GP blend 40 MPa	Normal GP blend 50 MPa		
265	301	326	387	490		
Normal GP/FA blend 20 MPa	Normal GP/FA blend 25 MPa	Normal GP/FA blend 32 MPa	Normal GP/FA blend 40 MPa	Normal GP/FA blend 50 MPa		
251	269	298	360	469		
Normal GP/ GGBFS blend 20 MPa	Normal GP/ GGBFS blend 25 MPa	Normal GP/ GGBFS blend 32 MPa	Normal GP/ GGBFS blend 40 MPa	Normal GP/ GGBFS blend 50 MPa		
236	268	290	343	433		
VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/ SLAG	VR400 40 MPa TREMIE/CFA GP/SLAG	
312	245	362	282	282	323	
VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/ SLAG	VR450 50 MPa TREMIE/CFA GP/SLAG		
426	313	413	313	337		
HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
250	282	304	346	454	477	505
TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa	
316	395	404	389	425	446	
KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%	STABILISED SAND 3%	STABILISED SAND 5%		
257	288	82	82	112		

Melbourne Metro Region

Table 1. Environmental profiles (A1-A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Indicator	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
GWP	**kg CO_2 eq**	**165**	**178**	**205**	**282**	**318**	**383**
ODP	kg CFC11 eq	5.66E-06	6.07E-06	6.47E-06	7.57E-06	8.15E-06	9.55E-06
AP	kg SO_2 eq	0.835	0.906	1.03	1.32	1.48	1.81
EP	kg PO_4^{3-} eq	0.111	0.121	0.135	0.176	0.196	0.236
POCP	kg C_2H_4 eq	0.0569	0.0612	0.0666	0.0807	0.0882	0.106
ADPE	kg Sb eq	2.08E-06	2.26E-06	2.58E-06	3.08E-06	3.68E-06	1.42E-05
ADPF	MJ_{NCV}	1500	1590	1820	2360	2630	3210

Table 2. Environmental parameters (A1-A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Parameter	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
PERE	MJ_{NCV}	1.89E+01	1.85E+01	2.33E+01	2.86E+01	3.16E+01	4.57E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-01
PERT	MJ_{NCV}	1.89E+01	1.85E+01	2.33E+01	2.86E+01	3.16E+01	4.58E+01
PENRE	MJ_{NCV}	1.55E+03	1.65E+03	1.88E+03	2.41E+03	2.68E+03	3.27E+03
PENRM	MJ_{NCV}	4.81E+00	5.57E+00	6.12E+00	7.43E+00	9.62E+00	2.34E+01
PENRT	MJ_{NCV}	1.55E+03	1.66E+03	1.88E+03	2.41E+03	2.69E+03	3.30E+03
SM	kg	1.46E+02	1.74E+02	1.77E+02	2.08E+02	2.39E+02	3.07E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.56E+00	3.66E+00	3.83E+00	4.10E+00	4.14E+00	4.35E+00
HWD	kg	5.16E-06	6.02E-06	6.60E-06	7.97E-06	1.03E-05	4.67E-05
NHWD	kg	9.05E-02	9.09E-02	1.15E-01	1.34E-01	1.50E-01	1.84E+00
RWD	kg	8.98E-04	1.05E-03	1.15E-03	1.39E-03	1.80E-03	5.66E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Melbourne Metro Region

Table 3. Environmental profiles (A1–A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Indicator	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
GWP	**kg CO_2 eq**	**191**	**214**	**232**	**270**	**338**
ODP	kg CFC11 eq	5.69E-06	6.04E-06	6.37E-06	6.97E-06	8.60E-06
AP	kg SO_2 eq	0.847	0.948	1.02	1.19	1.50
EP	kg PO_4^{3-} eq	0.121	0.134	0.144	0.165	0.206
POCP	kg C_2H_4 eq	0.0577	0.0624	0.0664	0.0741	0.0922
ADPE	kg Sb eq	2.12E-06	2.77E-06	3.51E-06	3.50E-06	3.62E-06
ADPF	MJ_{NCV}	1600	1780	1930	2200	2730

Table 4. Environmental parameters (A1–A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Parameter	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
PERE	MJ_{NCV}	1.91E+01	2.15E+01	2.37E+01	2.63E+01	3.10E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.91E+01	2.15E+01	2.37E+01	2.63E+01	3.10E+01
PENRE	MJ_{NCV}	1.64E+03	1.82E+03	1.96E+03	2.24E+03	2.78E+03
PENRM	MJ_{NCV}	4.81E+00	7.38E+00	1.04E+01	9.84E+00	9.84E+00
PENRT	MJ_{NCV}	1.64E+03	1.82E+03	1.97E+03	2.25E+03	2.79E+03
SM	kg	1.12E+02	1.29E+02	1.40E+02	1.68E+02	2.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.79E+00	3.82E+00	3.93E+00	4.00E+00	4.20E+00
HWD	kg	5.24E-06	7.95E-06	1.12E-05	1.05E-05	1.05E-05
NHWD	kg	8.75E-02	1.05E-01	1.25E-01	1.29E-01	1.42E-01
RWD	kg	9.09E-04	1.38E-03	1.94E-03	1.84E-03	1.84E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Melbourne Metro Region

Table 5. Environmental profiles (A1-A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Indicator	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
GWP	**kg CO_2 eq**	**215**	**240**	**270**	**322**	**397**
ODP	kg CFC11 eq	5.40E-06	5.92E-06	6.30E-06	6.89E-06	8.39E-06
AP	kg SO_2 eq	0.815	0.95	1.04	1.22	1.51
EP	kg PO_4^{3-} eq	0.126	0.142	0.157	0.183	0.225
POCP	kg C_2H_4 eq	0.0555	0.0619	0.0667	0.0750	0.0919
ADPE	kg Sb eq	2.08E-06	2.74E-06	2.38E-06	3.49E-06	3.59E-06
ADPF	MJ_{NCV}	1660	1870	2060	2410	2950

Table 6. Environmental parameters (A1-A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Parameter	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
PERE	MJ_{NCV}	1.89E+01	2.14E+01	2.27E+01	2.71E+01	3.15E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.89E+01	2.14E+01	2.27E+01	2.71E+01	3.15E+01
PENRE	MJ_{NCV}	1.67E+03	1.89E+03	2.07E+03	2.42E+03	2.96E+03
PENRM	MJ_{NCV}	4.81E+00	7.38E+00	5.46E+00	9.84E+00	9.84E+00
PENRT	MJ_{NCV}	1.68E+03	1.90E+03	2.08E+03	2.43E+03	2.97E+03
SM	kg	5.41E+01	8.74E+01	8.74E+01	9.98E+01	1.25E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.86E+00	3.90E+00	4.03E+00	4.15E+00	4.35E+00
HWD	kg	5.24E-06	7.95E-06	5.89E-06	1.05E-05	1.05E-05
NHWD	kg	8.21E-02	9.92E-02	9.38E-02	1.24E-01	1.33E-01
RWD	kg	9.09E-04	1.38E-03	1.03E-03	1.84E-03	1.84E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 7. Environmental profiles (A1-A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Indicator	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
GWP	**kg CO_2 eq**	**244**	**272**	**307**	**369**	**454**
ODP	kg CFC11 eq	5.74E-06	6.30E-06	6.74E-06	7.28E-06	9.07E-06
AP	kg SO_2 eq	0.906	1.05	1.16	1.35	1.69
EP	kg PO_4^{3-} eq	0.141	0.158	0.175	0.206	0.253
POCP	kg C_2H_4 eq	0.0599	0.0668	0.0724	0.0810	0.101
ADPE	kg Sb eq	2.15E-06	2.81E-06	2.47E-06	3.54E-06	3.72E-06
ADPF	MJ_{NCV}	1850	2070	2300	2720	3310

Table 8. Environmental parameters (A1-A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Parameter	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
PERE	MJ_{NCV}	2.06E+01	2.33E+01	2.49E+01	3.16E+01	3.49E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.06E+01	2.33E+01	2.49E+01	3.16E+01	3.49E+01
PENRE	MJ_{NCV}	1.85E+03	2.09E+03	2.30E+03	2.70E+03	3.31E+03
PENRM	MJ_{NCV}	4.81E+00	7.38E+00	5.46E+00	9.84E+00	9.84E+00
PENRT	MJ_{NCV}	1.86E+03	2.09E+03	2.31E+03	2.71E+03	3.32E+03
SM	kg	5.41E+01	8.74E+01	8.74E+01	9.98E+01	1.25E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.97E+00	4.02E+00	4.18E+00	4.24E+00	4.57E+00
HWD	kg	5.24E-06	7.95E-06	5.89E-06	1.05E-05	1.05E-05
NHWD	kg	8.64E-02	1.04E-01	9.93E-02	1.56E-01	1.42E-01
RWD	kg	9.09E-04	1.38E-03	1.03E-03	1.84E-03	1.84E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 9. Environmental profiles (A1-A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Indicator	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
GWP	**kg CO_2 eq**	**200**	**227**	**240**	**288**	**364**
ODP	kg CFC11 eq	5.70E-06	6.10E-06	6.27E-06	7.01E-06	8.22E-06
AP	kg SO_2 eq	0.849	0.957	1.01	1.21	1.53
EP	kg PO_4^{3-} eq	0.124	0.139	0.146	0.172	0.214
POCP	kg C_2H_4 eq	0.0579	0.0631	0.0655	0.0749	0.0901
ADPE	kg Sb eq	2.24E-06	2.54E-06	2.70E-06	3.21E-06	3.92E-06
ADPF	MJ_{NCV}	1640	1830	1920	2270	2820

Table 10. Environmental parameters (A1-A3), lower carbon concrete, Melbourne Metro (VIC), per m^3

Parameter	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
PERE	MJ_{NCV}	1.87E+01	2.07E+01	2.18E+01	2.54E+01	3.10E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.87E+01	2.07E+01	2.18E+01	2.54E+01	3.10E+01
PENRE	MJ_{NCV}	1.67E+03	1.86E+03	1.95E+03	2.30E+03	2.85E+03
PENRM	MJ_{NCV}	5.57E+00	6.56E+00	7.10E+00	8.74E+00	1.09E+01
PENRT	MJ_{NCV}	1.67E+03	1.87E+03	1.96E+03	2.31E+03	2.86E+03
SM	kg	1.01E+02	1.16E+02	1.25E+02	1.54E+02	2.00E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.78E+00	3.87E+00	3.88E+00	4.02E+00	4.26E+00
HWD	kg	6.02E-06	7.07E-06	7.66E-06	9.38E-06	1.17E-05
NHWD	kg	8.35E-02	9.28E-02	9.77E-02	1.13E-01	1.37E-01
RWD	kg	1.05E-03	1.23E-03	1.33E-03	1.63E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 11. Environmental profiles (A1-A3), normal class concrete, Melbourne Metro (VIC), per m^3

Indicator	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
GWP	**kg CO_2 eq**	**265**	**301**	**326**	**387**	**490**
ODP	kg CFC11 eq	5.53E-06	5.90E-06	6.13E-06	6.76E-06	7.87E-06
AP	kg SO_2 eq	0.879	0.991	1.07	1.26	1.58
EP	kg PO_4^{3-} eq	0.146	0.163	0.175	0.205	0.256
POCP	kg C_2H_4 eq	0.0583	0.0635	0.0669	0.0757	0.0907
ADPE	kg Sb eq	2.28E-06	2.58E-06	2.76E-06	3.27E-06	4.00E-06
ADPF	MJ_{NCV}	1910	2140	2290	2680	3340

Table 12. Environmental parameters (A1-A3), normal class concrete, Melbourne Metro (VIC), per m^3

Parameter	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
PERE	MJ_{NCV}	2.12E+01	2.36E+01	2.53E+01	2.93E+01	3.60E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.12E+01	2.36E+01	2.53E+01	2.93E+01	3.60E+01
PENRE	MJ_{NCV}	1.89E+03	2.12E+03	2.27E+03	2.65E+03	3.29E+03
PENRM	MJ_{NCV}	5.57E+00	6.56E+00	7.10E+00	8.74E+00	1.09E+01
PENRT	MJ_{NCV}	1.90E+03	2.12E+03	2.28E+03	2.66E+03	3.30E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.97E+00	4.08E+00	4.14E+00	4.31E+00	4.63E+00
HWD	kg	6.02E-06	7.07E-06	7.66E-06	9.38E-06	1.17E-05
NHWD	kg	9.08E-02	1.01E-01	1.08E-01	1.25E-01	1.51E-01
RWD	kg	1.05E-03	1.23E-03	1.33E-03	1.63E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 13. Environmental profiles (A1–A3), normal class concrete, Melbourne Metro (VIC), per m^3

Indicator	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
GWP	**kg CO_2 eq**	**251**	**269**	**298**	**360**	**469**
ODP	kg CFC11 eq	6.17E-06	6.65E-06	6.95E-06	7.72E-06	8.98E-06
AP	kg SO_2 eq	0.849	0.909	1.00	1.19	1.53
EP	kg PO_4^{3-} eq	0.142	0.152	0.166	0.197	0.251
POCP	kg C_2H_4 eq	0.0627	0.0678	0.0720	0.0819	0.0986
ADPE	kg Sb eq	2.24E-06	2.50E-06	2.94E-06	3.44E-06	4.30E-06
ADPF	MJ_{NCV}	1870	2000	2190	2590	3290

Table 14. Environmental parameters (A1–A3), normal class concrete, Melbourne Metro (VIC), per m^3

Parameter	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
PERE	MJ_{NCV}	2.01E+01	2.13E+01	2.35E+01	2.75E+01	3.46E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.01E+01	2.13E+01	2.35E+01	2.75E+01	3.46E+01
PENRE	MJ_{NCV}	1.87E+03	2.00E+03	2.19E+03	2.58E+03	3.26E+03
PENRM	MJ_{NCV}	5.57E+00	6.56E+00	8.20E+00	9.84E+00	1.26E+01
PENRT	MJ_{NCV}	1.87E+03	2.01E+03	2.20E+03	2.59E+03	3.27E+03
SM	kg	5.72E+01	8.32E+01	8.32E+01	9.36E+01	1.04E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.89E+00	3.91E+00	3.99E+00	4.15E+00	4.44E+00
HWD	kg	6.02E-06	7.07E-06	8.83E-06	1.05E-05	1.35E-05
NHWD	kg	8.86E-02	9.61E-02	1.09E-01	1.26E-01	1.56E-01
RWD	kg	1.05E-03	1.23E-03	1.54E-03	1.84E-03	2.35E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 15. Environmental profiles (A1-A3), normal class concrete, Melbourne Metro (VIC), per m^3

Indicator	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
GWP	**kg CO_2 eq**	**236**	**268**	**290**	**343**	**433**
ODP	kg CFC11 eq	5.50E-06	5.87E-06	6.10E-06	6.73E-06	7.83E-06
AP	kg SO_2 eq	0.849	0.956	1.03	1.21	1.52
EP	kg PO_4^{3-} eq	0.135	0.151	0.162	0.189	0.235
POCP	kg C_2H_4 eq	0.0572	0.0621	0.0654	0.0739	0.0885
ADPE	kg Sb eq	2.24E-06	2.55E-06	2.73E-06	3.17E-06	3.94E-06
ADPF	MJ_{NCV}	1770	1980	2130	2480	3080

Table 16. Environmental parameters (A1-A3), normal class concrete, Melbourne Metro (VIC), per m^3

Parameter	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
PERE	MJ_{NCV}	2.00E+01	2.22E+01	2.37E+01	2.73E+01	3.35E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.00E+01	2.22E+01	2.37E+01	2.73E+01	3.35E+01
PENRE	MJ_{NCV}	1.77E+03	1.98E+03	2.12E+03	2.47E+03	3.06E+03
PENRM	MJ_{NCV}	5.52E+00	6.56E+00	7.10E+00	8.47E+00	1.09E+01
PENRT	MJ_{NCV}	1.78E+03	1.99E+03	2.13E+03	2.48E+03	3.07E+03
SM	kg	3.54E+01	4.06E+01	4.37E+01	5.41E+01	6.97E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.88E+00	3.96E+00	4.02E+00	4.17E+00	4.44E+00
HWD	kg	5.96E-06	7.07E-06	7.66E-06	9.08E-06	1.17E-05
NHWD	kg	8.70E-02	9.71E-02	1.03E-01	1.18E-01	1.44E-01
RWD	kg	1.04E-03	1.23E-03	1.33E-03	1.58E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 17. Environmental profiles (A1-A3), concrete for Vic Roads applications, Melbourne Metro (VIC), per m^3

Indicator	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/ SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**312**	**245**	**362**	**282**	**282**	**323**
ODP	kg CFC11 eq	7.68E-06	7.25E-06	8.67E-06	8.16E-06	8.00E-06	8.60E-06
AP	kg SO_2 eq	1.08	1.15	1.24	1.32	1.32	1.47
EP	kg PO_4^{3-} eq	0.175	0.155	0.202	0.178	0.177	0.201
POCP	kg C_2H_4 eq	0.0800	0.0761	0.091	0.0863	0.0853	0.093
ADPE	kg Sb eq	1.89E-05	1.89E-05	1.89E-05	1.90E-05	2.11E-05	1.30E-05
ADPF	MJ_{NCV}	2340	2090	2680	2380	2390	2730

Table 18. Environmental parameters (A1-A3), concrete for Vic Roads applications, Melbourne Metro (VIC), per m^3

Parameter	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/ SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	2.85E+01	2.72E+01	3.12E+01	2.97E+01	3.19E+01	3.75E+01
PERM	MJ_{NCV}	2.89E-02	2.89E-02	2.89E-02	2.89E-02	7.21E-02	9.62E-02
PERT	MJ_{NCV}	2.85E+01	2.72E+01	3.12E+01	2.97E+01	3.20E+01	3.75E+01
PENRE	MJ_{NCV}	2.34E+03	2.14E+03	2.68E+03	2.44E+03	2.44E+03	2.78E+03
PENRM	MJ_{NCV}	2.14E+00	2.14E+00	2.14E+00	2.14E+00	5.35E+00	2.90E+01
PENRT	MJ_{NCV}	2.35E+03	2.14E+03	2.69E+03	2.44E+03	2.45E+03	2.81E+03
SM	kg	8.84E+01	1.77E+02	1.04E+02	2.08E+02	2.08E+02	2.39E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.06E+00	3.93E+00	4.21E+00	4.06E+00	3.97E+00	3.94E+00
HWD	kg	2.14E-05	2.14E-05	2.14E-05	2.14E-05	3.03E-05	4.52E-05
NHWD	kg	4.91E+00	4.90E+00	4.92E+00	4.91E+00	5.20E+00	1.41E+00
RWD	kg	4.16E-03	4.16E-03	4.16E-03	4.16E-03	4.98E-03	6.36E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

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Table 19. Environmental profiles (A1-A3), concrete for Vic Roads applications, Melbourne Metro (VIC), per m^3

Indicator	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**426**	**313**	**413**	**313**	**337**
ODP	kg CFC11 eq	1.12E-05	8.77E-06	9.29E-06	8.60E-06	8.84E-06
AP	kg SO_2 eq	1.49	1.47	1.40	1.46	1.53
EP	kg PO_4^{3-} eq	0.236	0.196	0.227	0.195	0.209
POCP	kg C_2H_4 eq	0.120	0.094	0.0988	0.094	0.0959
ADPE	kg Sb eq	1.95E-05	1.91E-05	1.91E-05	2.12E-05	1.36E-05
ADPF	MJ_{NCV}	3330	2610	3010	2620	2840

Table 20. Environmental parameters (A1-A3), concrete for Vic Roads applications, Melbourne Metro (VIC), per m^3

Parameter	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	9.33E+01	3.18E+01	3.42E+01	3.40E+01	3.92E+01
PERM	MJ_{NCV}	2.89E-02	2.89E-02	2.89E-02	7.21E-02	9.62E-02
PERT	MJ_{NCV}	9.33E+01	3.18E+01	3.43E+01	3.41E+01	3.93E+01
PENRE	MJ_{NCV}	3.30E+03	2.68E+03	3.00E+03	2.68E+03	2.89E+03
PENRM	MJ_{NCV}	2.14E+00	2.14E+00	2.14E+00	5.35E+00	3.17E+01
PENRT	MJ_{NCV}	3.30E+03	2.68E+03	3.01E+03	2.68E+03	2.92E+03
SM	kg	7.28E+01	2.34E+02	1.04E+02	2.34E+02	2.50E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.04E+01	4.20E+00	4.42E+00	4.11E+00	4.00E+00
HWD	kg	2.14E-05	2.14E-05	2.14E-05	3.03E-05	4.81E-05
NHWD	kg	4.92E+00	4.92E+00	4.93E+00	5.20E+00	1.43E+00
RWD	kg	4.16E-03	4.16E-03	4.16E-03	4.98E-03	6.87E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Melbourne Metro Region

Table 21. Environmental profiles (A1-A3), concrete for special applications, Melbourne Metro (VIC), per m^3

Indicator	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	**kg CO_2 eq**	**250**	**282**	**304**	**346**	**454**	**477**	**505**
ODP	kg CFC11 eq	5.69E-06	6.05E-06	6.32E-06	6.83E-06	8.24E-06	9.19E-06	1.09E-05
AP	kg SO_2 eq	0.896	1.00	1.08	1.23	1.61	1.82	2.14
EP	kg PO_4^{3-} eq	0.142	0.158	0.169	0.191	0.247	0.266	0.295
POCP	kg C_2H_4 eq	0.0595	0.0646	0.0681	0.0750	0.0936	0.105	0.123
ADPE	kg Sb eq	2.38E-06	2.78E-06	2.83E-06	3.24E-06	6.36E-06	1.29E-05	1.47E-05
ADPF	MJ_{NCV}	1860	2080	2220	2510	3240	3540	3940

Table 22. Environmental parameters (A1-A3), concrete for special applications, Melbourne Metro (VIC), per m^3

Parameter	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ_{NCV}	2.10E+01	2.34E+01	2.46E+01	2.77E+01	3.67E+01	4.48E+01	5.02E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-02	1.44E-01	1.35E-01
PERT	MJ_{NCV}	2.10E+01	2.34E+01	2.46E+01	2.77E+01	3.68E+01	4.49E+01	5.03E+01
PENRE	MJ_{NCV}	1.87E+03	2.08E+03	2.22E+03	2.50E+03	3.22E+03	3.54E+03	3.98E+03
PENRM	MJ_{NCV}	6.01E+00	6.78E+00	7.38E+00	8.74E+00	1.14E+01	2.00E+01	2.91E+01
PENRT	MJ_{NCV}	1.87E+03	2.08E+03	2.22E+03	2.51E+03	3.23E+03	3.56E+03	4.01E+03
SM	kg	3.74E+01	4.26E+01	4.68E+01	5.72E+01	8.32E+01	1.61E+02	2.96E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.94E+00	4.02E+00	4.11E+00	4.22E+00	4.52E+00	4.55E+00	4.56E+00
HWD	kg	6.49E-06	8.31E-06	7.95E-06	9.38E-06	1.90E-05	4.17E-05	5.01E-05
NHWD	kg	9.17E-02	1.08E-01	1.07E-01	1.20E-01	6.52E-01	1.71E+00	1.66E+00
RWD	kg	1.13E-03	1.42E-03	1.38E-03	1.63E-03	2.54E-03	4.94E-03	6.56E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	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	0.00E+00

Melbourne Metro Region

Table 23. Environmental profiles (A1–A3), concrete for special applications, Melbourne Metro (VIC), per m^3

Indicator	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
GWP	**kg CO_2 eq**	**316**	**395**	**404**	**389**	**425**	**446**
ODP	kg CFC11 eq	6.97E-06	8.29E-06	7.09E-06	6.93E-06	9.60E-06	9.85E-06
AP	kg SO_2 eq	1.22	1.54	1.32	1.27	1.44	1.50
EP	kg PO_4^{3-} eq	0.181	0.224	0.214	0.207	0.230	0.241
POCP	kg C_2H_4 eq	0.0748	0.0909	0.0792	0.0770	0.104	0.107
ADPE	kg Sb eq	1.24E-06	1.46E-06	3.30E-06	3.27E-06	3.02E-06	3.07E-06
ADPF	MJ_{NCV}	2350	2910	2800	2700	3160	3290

Table 24. Environmental parameters (A1–A3), concrete for special applications, Melbourne Metro (VIC), per m^3

Parameter	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
PERE	MJ_{NCV}	2.39E+01	2.91E+01	3.03E+01	2.94E+01	7.43E+01	7.55E+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}	2.39E+01	2.91E+01	3.03E+01	2.94E+01	7.43E+01	7.55E+01
PENRE	MJ_{NCV}	2.36E+03	2.93E+03	2.76E+03	2.67E+03	3.12E+03	3.25E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	8.74E+00	8.74E+00	6.01E+00	6.01E+00
PENRT	MJ_{NCV}	2.36E+03	2.93E+03	2.77E+03	2.68E+03	3.12E+03	3.25E+03
SM	kg	1.04E+02	1.46E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.15E+00	4.46E+00	4.43E+00	4.39E+00	2.39E+01	2.40E+01
HWD	kg	0.00E+00	0.00E+00	9.38E-06	9.38E-06	6.97E-06	6.97E-06
NHWD	kg	7.08E-02	8.35E-02	1.27E-01	1.25E-01	1.16E-01	1.19E-01
RWD	kg	0.00E+00	0.00E+00	1.63E-03	1.63E-03	1.20E-03	1.20E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Melbourne Metro Region

Table 25. Environmental profiles (A1-A3), concrete for special applications, Melbourne Metro (VIC), per m^3

Indicator	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
GWP	**kg CO_2 eq**	**82**	**112**	**257**	**288**	**82.0**
ODP	kg CFC11 eq	3.35E-06	3.72E-06	6.84E-06	6.39E-06	2.32E-06
AP	kg SO_2 eq	0.301	0.398	1.09	1.03	0.282
EP	kg PO_4^{3-} eq	0.0541	0.0692	0.157	0.163	0.0489
POCP	kg C_2H_4 eq	0.0303	0.0350	0.0713	0.0676	0.0221
ADPE	kg Sb eq	8.39E-07	6.25E-07	3.03E-06	2.74E-06	5.63E-07
ADPF	MJ_{NCV}	720	910	2070	2140	640

Table 26. Environmental parameters (A1-A3), concrete for special applications, Melbourne Metro (VIC), per m^3

Parameter	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
PERE	MJ_{NCV}	8.98E+00	1.04E+01	2.32E+01	2.36E+01	8.34E+00
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	8.98E+00	1.04E+01	2.32E+01	2.36E+01	8.34E+00
PENRE	MJ_{NCV}	7.38E+02	9.24E+02	2.10E+03	2.14E+03	6.50E+02
PENRM	MJ_{NCV}	1.26E+00	0.00E+00	8.20E+00	7.10E+00	0.00E+00
PENRT	MJ_{NCV}	7.39E+02	9.24E+02	2.11E+03	2.14E+03	6.50E+02
SM	kg	0.00E+00	0.00E+00	1.33E+02	4.37E+01	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.96E+00	3.08E+00	4.02E+00	4.13E+00	2.47E+00
HWD	kg	1.61E-06	2.59E-07	9.05E-06	7.62E-06	0.00E+00
NHWD	kg	4.49E-02	4.28E-02	1.08E-01	1.04E-01	2.99E-02
RWD	kg	2.73E-04	3.87E-05	1.57E-03	1.33E-03	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Melbourne South East Metro Region

Environmental profiles and parameters.

Product table list
Melbourne South East Metro Region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower Carbon Concrete Products

Table No. 1 and 2
- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa
- ENVISIA® 65 MPa

Table No. 3 and 4
- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 6
- ENVIROCRETE® 40% 20 MPa
- ENVIROCRETE® 40% 25 MPa
- ENVIROCRETE® 40% 32 MPa
- ENVIROCRETE® 40% 40 MPa
- ENVIROCRETE® 40 % 50 MPa

Table No. 7 and 8
- ENVIROCRETE® 30% 20 MPa
- ENVIROCRETE® 30% 25 MPa
- ENVIROCRETE® 30% 32 MPa
- ENVIROCRETE® 30% 40 MPa
- ENVIROCRETE® 30% 50 MPa

Table No. 9 and 10
- ENVIROCRETE 20 MPa
- ENVIROCRETE 25 MPa
- ENVIROCRETE 32 MPa
- ENVIROCRETE 40 MPa
- ENVIROCRETE 50 MPa

Normal Class Concrete Products

Table No. 11 and 12
- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 13 and 14
- NORMAL CLASS GP/FA BLEND 20 MPa
- NORMAL CLASS GP/FA BLEND 25 MPa
- NORMAL CLASS GP/FA BLEND 32 MPa
- NORMAL CLASS GP/FA BLEND 40 MPa
- NORMAL CLASS GP/FA BLEND 50 MPa

Table No. 15 and 16
- NORMAL CLASS GP/GGBFS BLEND 20 MPa
- NORMAL CLASS GP/GGBFS BLEND 25 MPa
- NORMAL CLASS GP/GGBFS BLEND 32 MPa
- NORMAL CLASS GP/GGBFS BLEND 40 MPa
- NORMAL CLASS GP/GGBFS BLEND 50 MPa

Vic Roads Concrete Products

Table No. 17 and 18
- VR330 32 MPa GP/FA
- VR330 32 MPa GP/SLAG
- VR400 40 MPa GP/FA
- VR400 40 MPa GP/SLAG
- VR400 40 MPa TREMIE GP/SLAG
- VR400 40 MPa TREMIE/CFA GP/SLAG

Table No. 19 and 20
- VR400 40 MPa SHOTCRETE
- VR450 50 MPa GP/SLAG
- VR450 50 MPa GP/FA
- VR450 50 MPa TREMIE GP/SLAG
- VR450 50 MPa TREMIE/CFA GP/SLAG

Concrete Products for Special Applications

Table No. 21 and 22
- HIGH SLUMP 20 MPa
- HIGH SLUMP 25 MPa
- HIGH SLUMP 32 MPa
- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 23 and 24
- TREMIE 40 MPa
- TREMIE 50 MPa
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa
- SHOTCRETE 40 MPa

Table No. 25 and 26
- STABILISED SAND 3%
- STABILISED SAND 5%
- KERB MACHINE 320KG/M^3
- KERB MACHINE 280KG/M^3
- NO FINES 4%

Melbourne South East Metro Region

GWP SUMMARY (kg CO_2 eq/m^3)

ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa	
168	183	207	284	320	379	
ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa		
193	215	232	271	336		
ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa		
229	252	282	336	413		
ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa		
255	279	315	375	463		
ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa		
202	228	241	289	364		
Normal GP blend 20 MPa	Normal GP blend 25 MPa	Normal GP blend 32 MPa	Normal GP blend 40 MPa	Normal GP blend 50 MPa		
261	297	327	384	485		
Normal GP/FA blend 20 MPa	Normal GP/FA blend 25 MPa	Normal GP/FA blend 32 MPa	Normal GP/FA blend 40 MPa	Normal GP/FA blend 50 MPa		
240	272	305	355	414		
Normal GP/ GGBFS blend 20 MPa	Normal GP/ GGBFS blend 25 MPa	Normal GP/ GGBFS blend 32 MPa	Normal GP/ GGBFS blend 40 MPa	Normal GP/ GGBFS blend 50 MPa		
233	265	292	341	444		
VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/ SLAG	VR400 40 MPa TREMIE/CFA GP/SLAG	
310	243	357	278	280	323	
VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/ SLAG	VR450 50 MPa TREMIE/CFA GP/SLAG		
415	309	410	311	336		
HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
252	284	306	349	457	480	507
TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa	
318	398	407	392	418	439	
KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%	STABILISED SAND 3%	STABILISED SAND 5%		
334	390	83	82	113		

Melbourne South East Metro Region

Table 1. Environmental profiles (A1-A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
GWP	**kg CO_2 eq**	**168**	**183**	**207**	**284**	**320**	**379**
ODP	kg CFC11 eq	6.14E-06	6.44E-06	6.83E-06	7.92E-06	8.48E-06	9.84E-06
AP	kg SO_2 eq	0.848	0.930	1.03	1.33	1.49	1.79
EP	kg PO_4^{3-} eq	0.114	0.123	0.136	0.177	0.197	0.234
POCP	kg C_2H_4 eq	0.0613	0.0650	0.0700	0.0839	0.0912	0.107
ADPE	kg Sb eq	2.14E-06	2.42E-06	2.67E-06	3.15E-06	3.76E-06	3.98E-06
ADPF	MJ_{NCV}	1550	1670	1860	2390	2660	3130

Table 2. Environmental profiles (A1-A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
PERE	MJ_{NCV}	1.85E+01	2.01E+01	2.28E+01	2.81E+01	3.13E+01	3.56E+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}	1.85E+01	2.01E+01	2.28E+01	2.81E+01	3.13E+01	3.56E+01
PENRE	MJ_{NCV}	1.60E+03	1.73E+03	1.92E+03	2.44E+03	2.72E+03	3.20E+03
PENRM	MJ_{NCV}	5.35E+00	6.23E+00	6.88E+00	7.98E+00	1.02E+01	1.02E+01
PENRT	MJ_{NCV}	1.61E+03	1.74E+03	1.92E+03	2.45E+03	2.73E+03	3.21E+03
SM	kg	1.46E+02	1.66E+02	1.77E+02	2.08E+02	2.39E+02	3.07E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.52E+00	3.56E+00	3.67E+00	3.95E+00	4.02E+00	4.32E+00
HWD	kg	5.81E-06	6.75E-06	7.45E-06	8.56E-06	1.09E-05	1.09E-05
NHWD	kg	9.82E-02	1.08E-01	1.23E-01	1.41E-01	1.58E-01	1.69E-01
RWD	kg	1.01E-03	1.17E-03	1.30E-03	1.49E-03	1.90E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Melbourne South East Metro Region

Table 3. Environmental profiles (A1-A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
GWP	**kg CO_2 eq**	**193**	**215**	**232**	**271**	**336**
ODP	kg CFC11 eq	6.08E-06	6.43E-06	6.70E-06	7.30E-06	8.39E-06
AP	kg SO_2 eq	0.856	0.956	1.03	1.20	1.49
EP	kg PO_4^{3-} eq	0.122	0.135	0.144	0.166	0.202
POCP	kg C_2H_4 eq	0.0614	0.0659	0.0694	0.0771	0.0907
ADPE	kg Sb eq	2.12E-06	2.40E-06	2.61E-06	3.00E-06	3.72E-06
ADPF	MJ_{NCV}	1640	1810	1930	2220	2710

Table 4. Environmental parameters (A1-A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
PERE	MJ_{NCV}	1.84E+01	2.03E+01	2.18E+01	2.50E+01	3.05E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.84E+01	2.03E+01	2.18E+01	2.50E+01	3.05E+01
PENRE	MJ_{NCV}	1.68E+03	1.85E+03	1.97E+03	2.26E+03	2.75E+03
PENRM	MJ_{NCV}	5.35E+00	6.23E+00	6.88E+00	7.98E+00	1.02E+01
PENRT	MJ_{NCV}	1.68E+03	1.85E+03	1.98E+03	2.27E+03	2.76E+03
SM	kg	1.12E+02	1.29E+02	1.40E+02	1.68E+02	2.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.57E+00	3.63E+00	3.69E+00	3.81E+00	4.03E+00
HWD	kg	5.81E-06	6.75E-06	7.45E-06	8.56E-06	1.09E-05
NHWD	kg	9.18E-02	1.02E-01	1.09E-01	1.23E-01	1.48E-01
RWD	kg	1.01E-03	1.17E-03	1.30E-03	1.49E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 5. Environmental profiles (A1–A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
GWP	**kg CO_2 eq**	**229**	**252**	**282**	**336**	**413**
ODP	kg CFC11 eq	6.04E-06	6.38E-06	6.66E-06	7.25E-06	8.32E-06
AP	kg SO_2 eq	0.880	0.98	1.06	1.25	1.54
EP	kg PO_4^{3-} eq	0.135	0.147	0.162	0.189	0.230
POCP	kg C_2H_4 eq	0.0622	0.0666	0.0705	0.0786	0.0925
ADPE	kg Sb eq	2.12E-06	2.39E-06	2.61E-06	3.00E-06	3.72E-06
ADPF	MJ_{NCV}	1790	1950	2140	2490	3030

Table 6. Environmental parameters (A1–A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
PERE	MJ_{NCV}	1.90E+01	2.08E+01	2.27E+01	2.63E+01	3.19E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.90E+01	2.08E+01	2.27E+01	2.63E+01	3.19E+01
PENRE	MJ_{NCV}	1.81E+03	1.97E+03	2.15E+03	2.50E+03	3.03E+03
PENRM	MJ_{NCV}	5.35E+00	6.23E+00	6.88E+00	7.98E+00	1.02E+01
PENRT	MJ_{NCV}	1.81E+03	1.98E+03	2.16E+03	2.50E+03	3.04E+03
SM	kg	6.45E+01	8.11E+01	7.49E+01	8.42E+01	1.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.66E+00	3.72E+00	3.82E+00	3.98E+00	4.22E+00
HWD	kg	5.81E-06	6.75E-06	7.45E-06	8.56E-06	1.09E-05
NHWD	kg	8.85E-02	9.69E-02	1.05E-01	1.19E-01	1.42E-01
RWD	kg	1.01E-03	1.17E-03	1.30E-03	1.49E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 7. Environmental profiles (A1-A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
GWP	**kg CO_2 eq**	**255**	**279**	**315**	**375**	**463**
ODP	kg CFC11 eq	6.06E-06	6.40E-06	6.69E-06	7.28E-06	8.36E-06
AP	kg SO_2 eq	0.907	1.01	1.10	1.29	1.59
EP	kg PO_4^{3-} eq	0.144	0.158	0.174	0.204	0.248
POCP	kg C_2H_4 eq	0.0632	0.0677	0.0719	0.0803	0.0945
ADPE	kg Sb eq	2.14E-06	2.42E-06	2.64E-06	3.04E-06	3.77E-06
ADPF	MJ_{NCV}	1910	2080	2300	2680	3260

Table 8. Environmental parameters (A1-A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
PERE	MJ_{NCV}	2.01E+01	2.20E+01	2.42E+01	2.81E+01	3.41E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.01E+01	2.20E+01	2.42E+01	2.81E+01	3.41E+01
PENRE	MJ_{NCV}	1.91E+03	2.09E+03	2.29E+03	2.66E+03	3.23E+03
PENRM	MJ_{NCV}	5.35E+00	6.23E+00	6.88E+00	7.98E+00	1.02E+01
PENRT	MJ_{NCV}	1.92E+03	2.09E+03	2.30E+03	2.67E+03	3.24E+03
SM	kg	3.33E+01	4.68E+01	3.43E+01	3.54E+01	5.41E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.74E+00	3.81E+00	3.92E+00	4.10E+00	4.37E+00
HWD	kg	5.81E-06	6.75E-06	7.45E-06	8.56E-06	1.09E-05
NHWD	kg	9.15E-02	1.00E-01	1.09E-01	1.24E-01	1.49E-01
RWD	kg	1.01E-03	1.17E-03	1.30E-03	1.49E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 9. Environmental profiles (A1-A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
GWP	**kg CO_2 eq**	**202**	**228**	**241**	**289**	**364**
ODP	kg CFC11 eq	5.99E-06	6.40E-06	6.52E-06	7.29E-06	8.34E-06
AP	kg SO_2 eq	0.854	0.963	1.02	1.22	1.52
EP	kg PO_4^{3-} eq	0.125	0.139	0.146	0.173	0.213
POCP	kg C_2H_4 eq	0.0607	0.0660	0.0680	0.0776	0.0915
ADPE	kg Sb eq	2.15E-06	2.42E-06	2.64E-06	3.09E-06	3.83E-06
ADPF	MJ_{NCV}	1660	1850	1950	2290	2820

Table 10. Environmental parameters (A1-A3), lower carbon concrete, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
PERE	MJ_{NCV}	1.81E+01	2.01E+01	2.12E+01	2.48E+01	3.02E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.81E+01	2.01E+01	2.12E+01	2.48E+01	3.02E+01
PENRE	MJ_{NCV}	1.70E+03	1.89E+03	1.98E+03	2.33E+03	2.85E+03
PENRM	MJ_{NCV}	5.41E+00	6.23E+00	7.01E+00	8.36E+00	1.08E+01
PENRT	MJ_{NCV}	1.70E+03	1.89E+03	1.98E+03	2.34E+03	2.87E+03
SM	kg	1.01E+02	1.16E+02	1.25E+02	1.54E+02	2.00E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.70E+00	3.78E+00	3.79E+00	3.94E+00	3.95E+00
HWD	kg	5.84E-06	6.72E-06	7.56E-06	8.97E-06	1.16E-05
NHWD	kg	8.74E-02	9.59E-02	1.02E-01	1.17E-01	1.40E-01
RWD	kg	1.02E-03	1.17E-03	1.31E-03	1.56E-03	2.02E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 11. Environmental profiles (A1-A3), normal class concrete, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
GWP	**kg CO_2 eq**	**261**	**297**	**327**	**384**	**485**
ODP	kg CFC11 eq	5.77E-06	6.16E-06	6.41E-06	7.01E-06	7.96E-06
AP	kg SO_2 eq	0.869	0.982	1.08	1.25	1.57
EP	kg PO_4^{3-} eq	0.144	0.162	0.176	0.204	0.253
POCP	kg C_2H_4 eq	0.0605	0.0658	0.0697	0.0779	0.0917
ADPE	kg Sb eq	2.18E-06	2.45E-06	2.71E-06	3.14E-06	3.89E-06
ADPF	MJ_{NCV}	1900	2130	2320	2680	3310

Table 12. Environmental parameters (A1-A3), normal class concrete, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
PERE	MJ_{NCV}	2.03E+01	2.27E+01	2.47E+01	2.84E+01	3.49E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.03E+01	2.27E+01	2.47E+01	2.84E+01	3.49E+01
PENRE	MJ_{NCV}	1.89E+03	2.12E+03	2.30E+03	2.65E+03	3.26E+03
PENRM	MJ_{NCV}	5.41E+00	6.23E+00	7.01E+00	8.36E+00	1.08E+01
PENRT	MJ_{NCV}	1.90E+03	2.12E+03	2.31E+03	2.66E+03	3.28E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.87E+00	3.98E+00	4.05E+00	4.21E+00	4.30E+00
HWD	kg	5.84E-06	6.72E-06	7.56E-06	8.97E-06	1.16E-05
NHWD	kg	9.39E-02	1.04E-01	1.12E-01	1.28E-01	1.53E-01
RWD	kg	1.02E-03	1.17E-03	1.31E-03	1.56E-03	2.02E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 13. Environmental profiles (A1-A3), normal class concrete, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
GWP	**kg CO_2 eq**	**240**	**272**	**305**	**355**	**414**
ODP	kg CFC11 eq	6.17E-06	6.52E-06	7.13E-06	7.95E-06	8.83E-06
AP	kg SO_2 eq	0.811	0.913	1.02	1.18	1.37
EP	kg PO_4^{3-} eq	0.136	0.152	0.169	0.195	0.225
POCP	kg C_2H_4 eq	0.0625	0.0673	0.0742	0.0838	0.0944
ADPE	kg Sb eq	2.32E-06	2.59E-06	2.83E-06	3.27E-06	3.84E-6
ADPF	MJ_{NCV}	1810	2020	2240	2580	2970

Table 14. Environmental parameters (A1-A3), normal class concrete, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
PERE	MJ_{NCV}	1.92E+01	2.13E+01	2.33E+01	2.65E+01	3.05E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.92E+01	2.13E+01	2.33E+01	2.65E+01	3.05E+01
PENRE	MJ_{NCV}	1.81E+03	2.01E+03	2.24E+03	2.57E+03	2.95E+03
PENRM	MJ_{NCV}	6.10E+00	7.01E+00	7.85E+00	9.34E+00	1.12E+01
PENRT	MJ_{NCV}	1.82E+03	2.02E+03	2.24E+03	2.58E+03	2.97E+03
SM	kg	5.72E+01	6.24E+01	6.66E+01	8.22E+01	1.03E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.78E+00	3.79E+00	3.94E+00	4.08E+00	4.26E+00
HWD	kg	6.58E-06	7.56E-06	8.45E-06	1.00E-05	1.20E-05
NHWD	kg	9.58E-02	1.05E-01	1.13E-01	1.28E-01	1.47E-01
RWD	kg	1.14E-03	1.31E-03	1.47E-03	1.74E-03	2.09E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 15. Environmental profiles (A1-A3), normal class concrete, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
GWP	**kg CO_2 eq**	**233**	**265**	**292**	**341**	**444**
ODP	kg CFC11 eq	5.74E-06	6.10E-06	6.39E-06	7.06E-06	8.25E-06
AP	kg SO_2 eq	0.839	0.946	1.04	1.21	1.56
EP	kg PO_4^{3-} eq	0.134	0.149	0.163	0.189	0.241
POCP	kg C_2H_4 eq	0.0594	0.0642	0.0682	0.0768	0.0929
ADPE	kg Sb eq	2.15E-06	2.43E-06	2.67E-06	3.08E-06	4.00E-06
ADPF	MJ_{NCV}	1770	1980	2150	2490	3170

Table 16. Environmental parameters (A1-A3), normal class concrete, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
PERE	MJ_{NCV}	1.91E+01	2.13E+01	2.32E+01	2.65E+01	3.37E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.91E+01	2.13E+01	2.32E+01	2.65E+01	3.37E+01
PENRE	MJ_{NCV}	1.78E+03	1.98E+03	2.15E+03	2.48E+03	3.15E+03
PENRM	MJ_{NCV}	5.41E+00	6.28E+00	7.01E+00	8.36E+00	1.12E+01
PENRT	MJ_{NCV}	1.78E+03	1.99E+03	2.16E+03	2.49E+03	3.16E+03
SM	kg	3.43E+01	3.95E+01	4.37E+01	5.30E+01	7.07E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.78E+00	3.85E+00	3.94E+00	4.07E+00	4.37E+00
HWD	kg	5.84E-06	6.78E-06	7.56E-06	8.97E-06	1.20E-05
NHWD	kg	9.05E-02	9.98E-02	1.08E-01	1.22E-01	1.53E-01
RWD	kg	1.02E-03	1.18E-03	1.31E-03	1.56E-03	2.09E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Melbourne South East Metro Region

Table 17. Environmental profiles (A1-A3), concrete for Vic Roads applications, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**310**	**243**	**357**	**278**	**280**	**323**
ODP	kg CFC11 eq	7.66E-06	7.18E-06	8.34E-06	7.78E-06	7.75E-06	8.41E-06
AP	kg SO_2 eq	1.07	1.13	1.22	1.30	1.30	1.47
EP	kg PO_4^{3-} eq	0.173	0.153	0.197	0.173	0.174	0.198
POCP	kg C_2H_4 eq	0.0801	0.0757	0.0883	0.0831	0.0836	0.0924
ADPE	kg Sb eq	1.70E-05	1.71E-05	1.72E-05	1.72E-05	2.12E-05	2.00E-05
ADPF	MJ_{NCV}	2320	2060	2630	2320	2360	2740

Table 18. Environmental parameters (A1-A3), concrete for Vic Roads applications, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	2.62E+01	2.49E+01	2.89E+01	2.74E+01	3.14E+01	3.93E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.21E-02	9.62E-02
PERT	MJ_{NCV}	2.62E+01	2.49E+01	2.89E+01	2.74E+01	3.15E+01	3.94E+01
PENRE	MJ_{NCV}	2.32E+03	2.11E+03	2.63E+03	2.38E+03	2.41E+03	2.78E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.35E+00	2.90E+01
PENRT	MJ_{NCV}	2.32E+03	2.11E+03	2.63E+03	2.38E+03	2.42E+03	2.81E+03
SM	kg	8.84E+01	1.77E+02	1.04E+02	2.08E+02	2.08E+02	2.39E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.00E+00	3.87E+00	4.09E+00	3.94E+00	3.93E+00	3.91E+00
HWD	kg	1.50E-05	1.50E-05	1.50E-05	1.50E-05	3.03E-05	5.18E-05
NHWD	kg	4.60E+00	4.60E+00	4.61E+00	4.60E+00	5.20E+00	3.41E+00
RWD	kg	3.52E-03	3.52E-03	3.52E-03	3.52E-03	4.98E-03	7.91E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Melbourne South East Metro Region

Table 19. Environmental profiles (A1-A3), concrete for Vic Roads applications, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**415**	**309**	**410**	**311**	**336**
ODP	kg CFC11 eq	1.00E-05	8.39E-06	8.97E-06	8.39E-06	8.66E-06
AP	kg SO_2 eq	1.52	1.44	1.38	1.44	1.53
EP	kg PO_4^{3-} eq	0.230	0.0906	0.0967	0.1920	0.2065
POCP	kg C_2H_4 eq	0.111	0.0906	0.097	0.0910	0.0955
ADPE	kg Sb eq	1.94E-05	1.92E-05	1.91E-05	2.13E-05	2.07E-05
ADPF	MJ_{NCV}	3190	2570	2980	2590	2850

Table 20. Environmental parameters (A1-A3), concrete for Vic Roads applications, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	9.25E+01	3.12E+01	3.37E+01	3.36E+01	4.10E+01
PERM	MJ_{NCV}	2.89E-02	2.89E-02	2.89E-02	7.21E-02	9.62E-02
PERT	MJ_{NCV}	9.25E+01	3.12E+01	3.37E+01	3.36E+01	4.11E+01
PENRE	MJ_{NCV}	3.15E+03	2.63E+03	2.96E+03	2.65E+03	2.89E+03
PENRM	MJ_{NCV}	2.14E+00	2.14E+00	2.14E+00	5.35E+00	3.17E+01
PENRT	MJ_{NCV}	3.15E+03	2.63E+03	2.97E+03	2.66E+03	2.93E+03
SM	kg	7.28E+01	2.34E+02	1.04E+02	2.34E+02	2.50E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.03E+01	4.08E+00	4.30E+00	4.08E+00	3.97E+00
HWD	kg	2.14E-05	2.14E-05	2.14E-05	3.03E-05	5.47E-05
NHWD	kg	4.92E+00	4.92E+00	4.93E+00	5.21E+00	3.43E+00
RWD	kg	4.16E-03	4.16E-03	4.16E-03	4.98E-03	8.42E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Melbourne South East Metro Region

Table 21. Environmental profiles (A1-A3), concrete for special applications, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	**kg CO_2 eq**	**252**	**284**	**306**	**349**	**457**	**480**	**507**
ODP	kg CFC11 eq	6.11E-06	6.48E-06	6.76E-06	7.25E-06	8.76E-06	9.67E-06	1.11E-05
AP	kg SO_2 eq	0.908	1.02	1.09	1.24	1.63	1.83	2.14
EP	kg PO_4^{3-} eq	0.144	0.160	0.171	0.193	0.250	0.269	0.296
POCP	kg C_2H_4 eq	0.0635	0.0686	0.0721	0.0789	0.0983	0.109	0.126
ADPE	kg Sb eq	2.33E-06	2.73E-06	2.78E-06	3.19E-06	6.32E-06	1.29E-05	1.47E-05
ADPF	MJ_{NCV}	1910	2120	2260	2550	3290	3590	3980

Table 22. Environmental parameters (A1-A3), concrete for special applications, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ_{NCV}	2.04E+01	2.29E+01	2.41E+01	2.71E+01	3.62E+01	4.45E+01	5.01E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-02	1.44E-01	1.35E-01
PERT	MJ_{NCV}	2.04E+01	2.29E+01	2.41E+01	2.71E+01	3.63E+01	4.46E+01	5.02E+01
PENRE	MJ_{NCV}	1.91E+03	2.12E+03	2.26E+03	2.54E+03	3.28E+03	3.59E+03	4.02E+03
PENRM	MJ_{NCV}	6.01E+00	6.78E+00	7.38E+00	8.74E+00	1.14E+01	2.00E+01	2.91E+01
PENRT	MJ_{NCV}	1.92E+03	2.13E+03	2.27E+03	2.55E+03	3.29E+03	3.61E+03	4.04E+03
SM	kg	3.74E+01	4.26E+01	4.68E+01	5.72E+01	8.32E+01	1.61E+02	2.96E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.92E+00	4.00E+00	4.09E+00	4.16E+00	4.50E+00	4.63E+00	4.74E+00
HWD	kg	6.49E-06	8.31E-06	7.95E-06	9.38E-06	1.90E-05	4.17E-05	5.01E-05
NHWD	kg	9.66E-02	1.13E-01	1.12E-01	1.25E-01	6.58E-01	1.71E+00	1.67E+00
RWD	kg	1.13E-03	1.42E-03	1.38E-03	1.63E-03	2.54E-03	4.94E-03	6.56E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	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	0.00E+00

Melbourne South East Metro Region

Table 23. Environmental profiles (A1-A3), concrete for special applications, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
GWP	**kg CO_2 eq**	**318**	**398**	**407**	**392**	**418**	**439**
ODP	kg CFC11 eq	7.41E-06	8.77E-06	7.61E-06	7.44E-06	8.76E-06	9.02E-06
AP	kg SO_2 eq	1.23	1.56	1.33	1.28	1.46	1.53
EP	kg PO_4^{3-} eq	0.183	0.227	0.217	0.210	0.226	0.237
POCP	kg C_2H_4 eq	0.0789	0.0953	0.0840	0.0818	0.0979	0.101
ADPE	kg Sb eq	1.20E-06	1.42E-06	3.25E-06	3.21E-06	2.95E-06	3.00E-06
ADPF	MJ_{NCV}	2390	2960	2850	2760	3070	3200

Table 24. Environmental parameters (A1-A3), concrete for special applications, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
PERE	MJ_{NCV}	2.34E+01	2.86E+01	2.98E+01	2.89E+01	7.36E+01	7.48E+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}	2.34E+01	2.86E+01	2.98E+01	2.89E+01	7.36E+01	7.48E+01
PENRE	MJ_{NCV}	2.41E+03	2.98E+03	2.82E+03	2.73E+03	3.02E+03	3.15E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	8.74E+00	8.74E+00	6.01E+00	6.01E+00
PENRT	MJ_{NCV}	2.41E+03	2.98E+03	2.83E+03	2.74E+03	3.02E+03	3.15E+03
SM	kg	1.04E+02	1.46E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.13E+00	4.44E+00	4.41E+00	4.37E+00	2.39E+01	2.40E+01
HWD	kg	0.00E+00	0.00E+00	9.38E-06	9.38E-06	6.97E-06	6.97E-06
NHWD	kg	7.63E-02	8.89E-02	1.32E-01	1.30E-01	1.18E-01	1.21E-01
RWD	kg	0.00E+00	0.00E+00	1.63E-03	1.63E-03	1.20E-03	1.20E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Melbourne South East Metro Region

Table 25. Environmental profiles (A1-A3), concrete for special applications, Melbourne South East Metro, (VIC), per m^3

Indicator	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
GWP	**kg CO_2 eq**	**82**	**113**	**334**	**290**	**83**
ODP	kg CFC11 eq	3.42E-06	3.80E-06	7.28E-06	6.52E-06	2.51E-06
AP	kg SO_2 eq	0.298	0.397	1.17	1.03	0.289
EP	kg PO_4^{3-} eq	0.0530	0.0685	0.185	0.162	0.0503
POCP	kg C_2H_4 eq	0.0311	0.0360	0.0778	0.0692	0.0238
ADPE	kg Sb eq	4.83E-07	5.56E-07	2.92E-06	2.58E-06	5.81E-07
ADPF	MJ_{NCV}	720	920	2450	2150	660

Table 26. Environmental parameters (A1-A3), concrete for special applications, Melbourne South East Metro, (VIC), per m^3

Parameter	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
PERE	MJ_{NCV}	8.15E+00	9.99E+00	2.57E+01	2.27E+01	8.13E+00
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	8.15E+00	9.99E+00	2.57E+01	2.27E+01	8.13E+00
PENRE	MJ_{NCV}	7.40E+02	9.35E+02	2.44E+03	2.15E+03	6.67E+02
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	7.87E+00	6.88E+00	0.00E+00
PENRT	MJ_{NCV}	7.40E+02	9.35E+02	2.45E+03	2.15E+03	6.67E+02
SM	kg	0.00E+00	0.00E+00	4.16E+01	4.16E+01	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.95E+00	3.08E+00	4.21E+00	3.87E+00	2.44E+00
HWD	kg	2.59E-07	2.59E-07	8.44E-06	7.38E-06	0.00E+00
NHWD	kg	3.69E-02	4.16E-02	1.17E-01	1.05E-01	3.86E-02
RWD	kg	3.87E-05	3.87E-05	1.47E-03	1.29E-03	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Geelong/Bellarine Region

Environmental profiles and parameters.

Product table list
Geelong Bellarine Region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower Carbon Concrete Products

Table No. 1 and 2
- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa
- ENVISIA® 65 MPa

Table No. 3 and 4
- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 6
- ENVIROCRETE® 40% 20 MPa
- ENVIROCRETE® 40% 25 MPa
- ENVIROCRETE® 40% 32 MPa
- ENVIROCRETE® 40% 40 MPa
- ENVIROCRETE® 40 % 50 MPa

Table No. 7 and 8
- ENVIROCRETE® 30% 20 MPa
- ENVIROCRETE® 30% 25 MPa
- ENVIROCRETE® 30% 32 MPa
- ENVIROCRETE® 30% 40 MPa
- ENVIROCRETE® 30% 50 MPa

Table No. 9 and 10
- ENVIROCRETE 20 MPa
- ENVIROCRETE 25 MPa
- ENVIROCRETE 32 MPa
- ENVIROCRETE 40 MPa
- ENVIROCRETE 50 MPa

Normal Class Concrete Products

Table No. 11 and 12
- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 13 and 14
- NORMAL CLASS GP/FA BLEND 20 MPa
- NORMAL CLASS GP/FA BLEND 25 MPa
- NORMAL CLASS GP/FA BLEND 32 MPa
- NORMAL CLASS GP/FA BLEND 40 MPa
- NORMAL CLASS GP/FA BLEND 50 MPa

Table No. 15 and 16
- NORMAL CLASS GP/GGBFS BLEND 20 MPa
- NORMAL CLASS GP/GGBFS BLEND 25 MPa
- NORMAL CLASS GP/GGBFS BLEND 32 MPa
- NORMAL CLASS GP/GGBFS BLEND 40 MPa
- NORMAL CLASS GP/GGBFS BLEND 50 MPa

Vic Roads Concrete Products

Table No. 17 and 18
- VR330 32 MPa GP/FA
- VR330 32 MPa GP/SLAG
- VR400 40 MPa GP/FA
- VR400 40 MPa GP/SLAG
- VR400 40 MPa TREMIE GP/SLAG
- VR400 40 MPa TREMIE/CFA GP/SLAG

Table No. 19 and 20
- VR400 40 MPa SHOTCRETE
- VR450 50 MPa GP/SLAG
- VR450 50 MPa GP/FA
- VR450 50 MPa TREMIE GP/SLAG
- VR450 50 MPa TREMIE/CFA GP/SLAG

Concrete Products for Special Applications

Table No. 21 and 22
- HIGH SLUMP 20 MPa
- HIGH SLUMP 25 MPa
- HIGH SLUMP 32 MPa
- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 23 and 24
- TREMIE 40 MPa
- TREMIE 50 MPa
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa
- SHOTCRETE 40 MPa

Table No. 25 and 26
- STABILISED SAND 3%
- STABILISED SAND 5%
- KERB MACHINE 320KG/M^3
- KERB MACHINE 280KG/M^3
- NO FINES 4%

Geelong/Bellarine Region

GWP SUMMARY (kg CO_2 eq/m^3)

ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa	
160	174	198	290	326	383	
ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa		
183	206	222	276	341		
ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa		
219	241	271	339	416		
ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa		
244	268	303	378	464		
ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa		
192	218	232	279	354		
Normal GP blend 20 MPa	Normal GP blend 25 MPa	Normal GP blend 32 MPa	Normal GP blend 40 MPa	Normal GP blend 50 MPa		
255	290	315	376	477		
Normal GP/FA blend 20 MPa	Normal GP/FA blend 25 MPa	Normal GP/FA blend 32 MPa	Normal GP/FA blend 40 MPa	Normal GP/FA blend 50 MPa		
242	261	289	350	458		
Normal GP/ GGBFS blend 20 MPa	Normal GP/ GGBFS blend 25 MPa	Normal GP/ GGBFS blend 32 MPa	Normal GP/ GGBFS blend 40 MPa	Normal GP/ GGBFS blend 50 MPa		
227	258	281	333	422		
VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/ SLAG	VR400 40 MPa TREMIE/CFA GP/SLAG	
315	249	362	284	286	325	
VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/ SLAG	VR450 50 MPa TREMIE/CFA GP/SLAG		
414	315	413	316	339		
HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
276	316	347	412	458	481	508
TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa	
307	386	393	378	416	436	
KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%	STABILISED SAND 3%	STABILISED SAND 5%		
264	285	74	85	115		

Geelong/Bellarine Region

Table 1. Environmental profiles (A1-A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
GWP	**kg CO_2 eq**	**160**	**174**	**198**	**290**	**326**	**383**
ODP	kg CFC11 eq	4.53E-06	4.86E-06	5.24E-06	8.18E-06	8.84E-06	1.01E-05
AP	kg SO_2 eq	0.785	0.869	0.97	1.34	1.51	1.81
EP	kg PO_4^{3-} eq	0.102	0.111	0.124	0.180	0.201	0.236
POCP	kg C_2H_4 eq	0.0475	0.0515	0.0563	0.0857	0.0938	0.109
ADPE	kg Sb eq	2.06E-06	2.34E-06	2.60E-06	3.04E-06	3.67E-06	3.88E-06
ADPF	MJ_{NCV}	1420	1540	1720	2450	2720	3190

Table 2. Environmental parameters (A1-A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
PERE	MJ_{NCV}	2.11E+01	2.25E+01	2.51E+01	3.03E+01	3.31E+01	3.73E+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}	2.11E+01	2.25E+01	2.51E+01	3.03E+01	3.31E+01	3.73E+01
PENRE	MJ_{NCV}	1.46E+03	1.58E+03	1.77E+03	2.51E+03	2.78E+03	3.26E+03
PENRM	MJ_{NCV}	5.35E+00	6.23E+00	6.88E+00	7.98E+00	1.02E+01	1.02E+01
PENRT	MJ_{NCV}	1.46E+03	1.59E+03	1.77E+03	2.51E+03	2.79E+03	3.27E+03
SM	kg	1.46E+02	1.66E+02	1.77E+02	2.08E+02	2.39E+02	3.07E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.45E+00	3.49E+00	3.60E+00	3.95E+00	4.02E+00	4.26E+00
HWD	kg	5.81E-06	6.75E-06	7.45E-06	8.56E-06	1.09E-05	1.09E-05
NHWD	kg	1.08E-01	1.16E-01	1.31E-01	1.43E-01	1.58E-01	1.68E-01
RWD	kg	1.01E-03	1.17E-03	1.30E-03	1.49E-03	1.90E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Geelong/Bellarine Region

Table 3. Environmental profiles (A1–A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
GWP	**kg CO_2 eq**	**183**	**206**	**222**	**276**	**341**
ODP	kg CFC11 eq	4.38E-06	4.74E-06	5.02E-06	7.56E-06	8.70E-06
AP	kg SO_2 eq	0.790	0.890	0.96	1.21	1.50
EP	kg PO_4^{3-} eq	0.109	0.122	0.131	0.168	0.205
POCP	kg C_2H_4 eq	0.0469	0.0515	0.0549	0.0790	0.0930
ADPE	kg Sb eq	2.04E-06	2.33E-06	2.54E-06	2.88E-06	3.60E-06
ADPF	MJ_{NCV}	1500	1660	1790	2270	2760

Table 4. Environmental parameters (A1–A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
PERE	MJ_{NCV}	2.10E+01	2.27E+01	2.40E+01	2.71E+01	3.22E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.10E+01	2.27E+01	2.40E+01	2.71E+01	3.22E+01
PENRE	MJ_{NCV}	1.52E+03	1.69E+03	1.81E+03	2.32E+03	2.81E+03
PENRM	MJ_{NCV}	5.35E+00	6.23E+00	6.88E+00	7.98E+00	1.02E+01
PENRT	MJ_{NCV}	1.53E+03	1.70E+03	1.82E+03	2.33E+03	2.82E+03
SM	kg	1.12E+02	1.29E+02	1.40E+02	1.68E+02	2.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.50E+00	3.56E+00	3.62E+00	3.80E+00	4.02E+00
HWD	kg	5.81E-06	6.75E-06	7.45E-06	8.56E-06	1.09E-05
NHWD	kg	1.01E-01	1.10E-01	1.17E-01	1.27E-01	1.51E-01
RWD	kg	1.01E-03	1.17E-03	1.30E-03	1.49E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Geelong/Bellarine Region

Table 5. Environmental profiles (A1-A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
GWP	**kg CO_2 eq**	**219**	**241**	**271**	**339**	**416**
ODP	kg CFC11 eq	4.22E-06	4.57E-06	4.80E-06	7.29E-06	8.37E-06
AP	kg SO_2 eq	0.809	0.91	0.99	1.25	1.54
EP	kg PO_4^{3-} eq	0.121	0.134	0.148	0.190	0.231
POCP	kg C_2H_4 eq	0.0467	0.0511	0.0547	0.0788	0.0926
ADPE	kg Sb eq	2.03E-06	2.32E-06	2.54E-06	2.88E-06	3.60E-06
ADPF	MJ_{NCV}	1640	1800	1980	2530	3060

Table 6. Environmental parameters (A1-A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
PERE	MJ_{NCV}	2.16E+01	2.31E+01	2.50E+01	2.84E+01	3.36E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.16E+01	2.31E+01	2.50E+01	2.84E+01	3.36E+01
PENRE	MJ_{NCV}	1.64E+03	1.80E+03	1.97E+03	2.53E+03	3.06E+03
PENRM	MJ_{NCV}	5.35E+00	6.23E+00	6.88E+00	7.98E+00	1.02E+01
PENRT	MJ_{NCV}	1.64E+03	1.81E+03	1.98E+03	2.54E+03	3.07E+03
SM	kg	6.45E+01	8.11E+01	7.49E+01	8.42E+01	1.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.59E+00	3.65E+00	3.74E+00	3.96E+00	4.20E+00
HWD	kg	5.81E-06	6.75E-06	7.45E-06	8.56E-06	1.09E-05
NHWD	kg	9.76E-02	1.05E-01	1.13E-01	1.23E-01	1.45E-01
RWD	kg	1.01E-03	1.17E-03	1.30E-03	1.49E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Geelong/Bellarine Region

Table 7. Environmental profiles (A1-A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
GWP	**kg CO_2 eq**	**244**	**268**	**303**	**378**	**464**
ODP	kg CFC11 eq	4.16E-06	4.51E-06	4.72E-06	7.20E-06	8.26E-06
AP	kg SO_2 eq	0.834	0.93	1.02	1.29	1.59
EP	kg PO_4^{3-} eq	0.130	0.144	0.160	0.204	0.248
POCP	kg C_2H_4 eq	0.0471	0.0516	0.0552	0.0794	0.0934
ADPE	kg Sb eq	2.06E-06	2.34E-06	2.57E-06	2.92E-06	3.64E-06
ADPF	MJ_{NCV}	1750	1920	2120	2700	3270

Table 8. Environmental parameters (A1-A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
PERE	MJ_{NCV}	2.27E+01	2.44E+01	2.64E+01	3.01E+01	3.58E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.27E+01	2.44E+01	2.64E+01	3.01E+01	3.58E+01
PENRE	MJ_{NCV}	1.73E+03	1.90E+03	2.10E+03	2.68E+03	3.24E+03
PENRM	MJ_{NCV}	5.35E+00	6.23E+00	6.88E+00	7.98E+00	1.02E+01
PENRT	MJ_{NCV}	1.74E+03	1.91E+03	2.10E+03	2.69E+03	3.26E+03
SM	kg	3.33E+01	4.68E+01	3.43E+01	3.54E+01	5.41E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.66E+00	3.73E+00	3.84E+00	4.09E+00	4.36E+00
HWD	kg	5.81E-06	6.75E-06	7.45E-06	8.56E-06	1.09E-05
NHWD	kg	1.01E-01	1.08E-01	1.16E-01	1.28E-01	1.51E-01
RWD	kg	1.01E-03	1.17E-03	1.30E-03	1.49E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Geelong/Bellarine Region

Table 9. Environmental profiles (A1–A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
GWP	**kg CO_2 eq**	**192**	**218**	**232**	**279**	**354**
ODP	kg CFC11 eq	4.31E-06	4.70E-06	4.90E-06	5.63E-06	6.81E-06
AP	kg SO_2 eq	0.788	0.896	0.95	1.15	1.47
EP	kg PO_4^{3-} eq	0.112	0.126	0.134	0.160	0.202
POCP	kg C_2H_4 eq	0.0465	0.0515	0.0541	0.0634	0.0781
ADPE	kg Sb eq	2.05E-06	2.33E-06	2.52E-06	3.00E-06	3.80E-06
ADPF	MJ_{NCV}	1520	1710	1810	2150	2690

Table 10. Environmental parameters (A1–A3), lower carbon concrete, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
PERE	MJ_{NCV}	2.05E+01	2.23E+01	2.33E+01	2.67E+01	3.21E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.05E+01	2.23E+01	2.33E+01	2.67E+01	3.21E+01
PENRE	MJ_{NCV}	1.54E+03	1.73E+03	1.82E+03	2.16E+03	2.71E+03
PENRM	MJ_{NCV}	5.55E+00	6.39E+00	7.02E+00	8.49E+00	1.09E+01
PENRT	MJ_{NCV}	1.55E+03	1.73E+03	1.83E+03	2.17E+03	2.72E+03
SM	kg	1.01E+02	1.16E+02	1.25E+02	1.54E+02	2.00E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.53E+00	3.62E+00	3.66E+00	3.81E+00	4.05E+00
HWD	kg	6.01E-06	6.92E-06	7.60E-06	9.10E-06	1.17E-05
NHWD	kg	9.53E-02	1.04E-01	1.09E-01	1.23E-01	1.47E-01
RWD	kg	1.05E-03	1.20E-03	1.32E-03	1.58E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Geelong/Bellarine Region

Table 11. Environmental profiles (A1-A3), normal class concrete, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
GWP	**kg CO_2 eq**	**255**	**290**	**315**	**376**	**477**
ODP	kg CFC11 eq	3.94E-06	4.27E-06	4.50E-06	5.08E-06	6.06E-06
AP	kg SO_2 eq	0.811	0.922	1.00	1.19	1.51
EP	kg PO_4^{3-} eq	0.132	0.150	0.162	0.192	0.241
POCP	kg C_2H_4 eq	0.0454	0.0501	0.0536	0.0618	0.0757
ADPE	kg Sb eq	2.09E-06	2.38E-06	2.59E-06	3.06E-06	3.87E-06
ADPF	MJ_{NCV}	1770	1990	2150	2530	3170

Table 12. Environmental parameters (A1-A3), normal class concrete, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
PERE	MJ_{NCV}	2.30E+01	2.52E+01	2.68E+01	3.06E+01	3.70E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.30E+01	2.52E+01	2.68E+01	3.06E+01	3.70E+01
PENRE	MJ_{NCV}	1.74E+03	1.96E+03	2.11E+03	2.48E+03	3.10E+03
PENRM	MJ_{NCV}	5.55E+00	6.39E+00	7.02E+00	8.49E+00	1.09E+01
PENRT	MJ_{NCV}	1.75E+03	1.96E+03	2.12E+03	2.49E+03	3.11E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.72E+00	3.83E+00	3.92E+00	4.10E+00	4.41E+00
HWD	kg	6.01E-06	6.92E-06	7.60E-06	9.10E-06	1.17E-05
NHWD	kg	1.02E-01	1.12E-01	1.18E-01	1.34E-01	1.60E-01
RWD	kg	1.05E-03	1.20E-03	1.32E-03	1.58E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Geelong/Bellarine Region

Table 13. Environmental profiles (A1–A3), normal class concrete, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
GWP	**kg CO_2 eq**	**242**	**261**	**289**	**350**	**458**
ODP	kg CFC11 eq	4.68E-06	5.24E-06	5.52E-06	6.25E-06	7.47E-06
AP	kg SO_2 eq	0.784	0.849	0.94	1.13	1.47
EP	kg PO_4^{3-} eq	0.129	0.140	0.154	0.185	0.238
POCP	kg C_2H_4 eq	0.0506	0.0563	0.0602	0.0698	0.086
ADPE	kg Sb eq	2.06E-06	2.53E-06	2.75E-06	3.30E-06	4.19E-06
ADPF	MJ_{NCV}	1740	1890	2060	2460	3150

Table 14. Environmental profiles (A1–A3), normal class concrete, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
PERE	MJ_{NCV}	2.17E+01	2.30E+01	2.48E+01	2.86E+01	3.55E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.17E+01	2.30E+01	2.48E+01	2.86E+01	3.55E+01
PENRE	MJ_{NCV}	1.73E+03	1.87E+03	2.05E+03	2.43E+03	3.10E+03
PENRM	MJ_{NCV}	5.55E+00	7.38E+00	8.06E+00	9.84E+00	1.26E+01
PENRT	MJ_{NCV}	1.73E+03	1.88E+03	2.05E+03	2.44E+03	3.12E+03
SM	kg	5.72E+01	8.32E+01	8.32E+01	9.36E+01	1.04E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.62E+00	3.65E+00	3.75E+00	3.90E+00	4.25E+00
HWD	kg	6.01E-06	7.98E-06	8.72E-06	1.05E-05	1.35E-05
NHWD	kg	9.97E-02	1.11E-01	1.19E-01	1.36E-01	1.65E-01
RWD	kg	1.05E-03	1.39E-03	1.52E-03	1.84E-03	2.35E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 15. Environmental profiles (A1-A3), normal class concrete, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
GWP	**kg CO_2 eq**	**227**	**258**	**281**	**333**	**422**
ODP	kg CFC11 eq	4.00E-06	4.34E-06	4.59E-06	5.18E-06	6.19E-06
AP	kg SO_2 eq	0.784	0.891	0.97	1.15	1.45
EP	kg PO_4^{3-} eq	0.122	0.138	0.150	0.176	0.222
POCP	kg C_2H_4 eq	0.0449	0.0496	0.0530	0.0611	0.0748
ADPE	kg Sb eq	2.06E-06	2.34E-06	2.55E-06	3.02E-06	3.82E-06
ADPF	MJ_{NCV}	1640	1850	1990	2340	2920

Table 16. Environmental parameters (A1-A3), normal class concrete, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
PERE	MJ_{NCV}	2.18E+01	2.38E+01	2.52E+01	2.86E+01	3.45E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.18E+01	2.38E+01	2.52E+01	2.86E+01	3.45E+01
PENRE	MJ_{NCV}	1.63E+03	1.83E+03	1.98E+03	2.31E+03	2.89E+03
PENRM	MJ_{NCV}	5.55E+00	6.39E+00	7.02E+00	8.49E+00	1.09E+01
PENRT	MJ_{NCV}	1.64E+03	1.84E+03	1.98E+03	2.32E+03	2.90E+03
SM	kg	3.54E+01	4.06E+01	4.37E+01	5.41E+01	6.97E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.62E+00	3.73E+00	3.81E+00	3.96E+00	4.23E+00
HWD	kg	6.01E-06	6.92E-06	7.60E-06	9.10E-06	1.17E-05
NHWD	kg	9.90E-02	1.08E-01	1.14E-01	1.28E-01	1.54E-01
RWD	kg	1.05E-03	1.20E-03	1.32E-03	1.58E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 17. Environmental profiles (A1–A3), concrete for Vic Roads applications, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**315**	**249**	**362**	**284**	**286**	**325**
ODP	kg CFC11 eq	7.69E-06	7.39E-06	8.41E-06	8.05E-06	8.05E-06	8.24E-06
AP	kg SO_2 eq	1.07	1.15	1.23	1.32	1.32	1.46
EP	kg PO_4^{3-} eq	0.175	0.155	0.199	0.176	0.177	0.198
POCP	kg C_2H_4 eq	0.0805	0.0773	0.089	0.0852	0.0856	0.091
ADPE	kg Sb eq	1.87E-05	1.88E-05	1.88E-05	1.89E-05	2.10E-05	1.99E-05
ADPF	MJ_{NCV}	2380	2140	2690	2400	2420	2760

Table 18. Environmental parameters (A1–A3), concrete for Vic Roads applications, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	3.04E+01	2.92E+01	3.29E+01	3.14E+01	3.37E+01	4.18E+01
PERM	MJ_{NCV}	2.89E-02	2.89E-02	2.89E-02	2.89E-02	7.21E-02	9.62E-02
PERT	MJ_{NCV}	3.05E+01	2.92E+01	3.29E+01	3.14E+01	3.38E+01	4.19E+01
PENRE	MJ_{NCV}	2.38E+03	2.19E+03	2.68E+03	2.46E+03	2.48E+03	2.80E+03
PENRM	MJ_{NCV}	2.14E+00	2.14E+00	2.14E+00	2.14E+00	5.35E+00	2.90E+01
PENRT	MJ_{NCV}	2.38E+03	2.19E+03	2.68E+03	2.46E+03	2.49E+03	2.83E+03
SM	kg	8.84E+01	1.77E+02	1.04E+02	2.08E+02	2.08E+02	2.39E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.00E+00	3.87E+00	4.10E+00	3.95E+00	3.96E+00	3.89E+00
HWD	kg	2.14E-05	2.14E-05	2.14E-05	2.14E-05	3.03E-05	5.18E-05
NHWD	kg	4.92E+00	4.92E+00	4.92E+00	4.92E+00	5.21E+00	3.41E+00
RWD	kg	4.16E-03	4.16E-03	4.16E-03	4.16E-03	4.98E-03	7.91E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

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Table 19. Environmental profiles (A1-A3), concrete for Vic Roads applications, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/SLAG	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**414**	**315**	**413**	**316**	**339**
ODP	kg CFC11 eq	9.24E-06	8.68E-06	8.98E-06	8.61E-06	8.48E-06
AP	kg SO_2 eq	1.49	1.46	1.39	1.46	1.52
EP	kg PO_4^{3-} eq	0.224	0.194	0.224	0.194	0.205
POCP	kg C_2H_4 eq	0.104	0.093	0.097	0.092	0.093
ADPE	kg Sb eq	1.94E-05	1.90E-05	1.89E-05	2.11E-05	2.05E-05
ADPF	MJ_{NCV}	3160	2630	3010	2650	2860

Table 20. Environmental parameters (A1-A3), concrete for Vic Roads applications, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/SLAG	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	9.56E+01	3.35E+01	3.60E+01	3.58E+01	4.35E+01
PERM	MJ_{NCV}	2.89E-02	2.89E-02	2.89E-02	7.21E-02	9.62E-02
PERT	MJ_{NCV}	9.57E+01	3.36E+01	3.60E+01	3.59E+01	4.36E+01
PENRE	MJ_{NCV}	3.11E+03	2.70E+03	3.00E+03	2.71E+03	2.91E+03
PENRM	MJ_{NCV}	2.14E+00	2.14E+00	2.14E+00	5.35E+00	3.17E+01
PENRT	MJ_{NCV}	3.11E+03	2.70E+03	3.00E+03	2.72E+03	2.94E+03
SM	kg	7.28E+01	2.34E+02	1.04E+02	2.34E+02	2.50E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.03E+01	4.11E+00	4.33E+00	4.08E+00	3.95E+00
HWD	kg	2.14E-05	2.14E-05	2.14E-05	3.03E-05	5.47E-05
NHWD	kg	4.93E+00	4.92E+00	4.93E+00	5.21E+00	3.43E+00
RWD	kg	4.16E-03	4.16E-03	4.16E-03	4.98E-03	8.42E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 21. Environmental profiles (A1–A3), concrete for special applications, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	**kg CO_2 eq**	**276**	**316**	**347**	**412**	**458**	**481**	**508**
ODP	kg CFC11 eq	4.19E-06	4.56E-06	4.86E-06	5.44E-06	8.37E-06	9.30E-06	1.08E-05
AP	kg SO_2 eq	0.878	1.00	1.10	1.30	1.61	1.82	2.13
EP	kg PO_4^{3-} eq	0.143	0.163	0.178	0.209	0.247	0.266	0.293
POCP	kg C_2H_4 eq	0.0486	0.0540	0.0582	0.0668	0.095	0.106	0.122
ADPE	kg Sb eq	2.27E-06	2.59E-06	2.82E-06	3.35E-06	6.31E-06	1.29E-05	1.46E-05
ADPF	MJ_{NCV}	1910	2160	2350	2750	3290	3590	3970

Table 22. Environmental parameters (A1–A3), concrete for special applications, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ_{NCV}	2.46E+01	2.70E+01	2.90E+01	3.29E+01	3.86E+01	4.70E+01	5.23E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-02	1.44E-01	1.35E-01
PERT	MJ_{NCV}	2.46E+01	2.70E+01	2.90E+01	3.29E+01	3.87E+01	4.71E+01	5.24E+01
PENRE	MJ_{NCV}	1.88E+03	2.12E+03	2.31E+03	2.70E+03	3.27E+03	3.59E+03	4.01E+03
PENRM	MJ_{NCV}	6.03E+00	7.01E+00	7.75E+00	9.34E+00	1.14E+01	2.00E+01	2.91E+01
PENRT	MJ_{NCV}	1.88E+03	2.13E+03	2.32E+03	2.71E+03	3.28E+03	3.61E+03	4.04E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E+01	1.61E+02	2.96E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.91E+00	4.00E+00	4.10E+00	4.25E+00	4.48E+00	4.62E+00	4.66E+00
HWD	kg	6.53E-06	7.58E-06	8.31E-06	1.00E-05	1.90E-05	4.17E-05	5.01E-05
NHWD	kg	1.09E-01	1.19E-01	1.27E-01	1.43E-01	6.60E-01	1.72E+00	1.67E+00
RWD	kg	1.13E-03	1.32E-03	1.45E-03	1.74E-03	2.54E-03	4.94E-03	6.56E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	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	0.00E+00

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Table 23. Environmental profiles (A1–A3), concrete for special applications, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
GWP	**kg CO_2 eq**	**307**	**386**	**393**	**378**	**416**	**436**
ODP	kg CFC11 eq	5.64E-06	6.88E-06	5.35E-06	5.21E-06	7.83E-06	8.04E-06
AP	kg SO_2 eq	1.16	1.48	1.25	1.20	1.43	1.49
EP	kg PO_4^{3-} eq	0.170	0.213	0.201	0.193	0.219	0.229
POCP	kg C_2H_4 eq	0.0637	0.079	0.0649	0.0629	0.090	0.093
ADPE	kg Sb eq	1.13E-06	1.36E-06	3.17E-06	3.13E-06	2.90E-06	2.95E-06
ADPF	MJ_{NCV}	2230	2790	2650	2560	3010	3140

Table 24. Environmental parameters (A1–A3), concrete for special applications, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
PERE	MJ_{NCV}	2.53E+01	3.05E+01	3.21E+01	3.12E+01	7.67E+01	7.80E+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}	2.53E+01	3.05E+01	3.21E+01	3.12E+01	7.67E+01	7.80E+01
PENRE	MJ_{NCV}	2.24E+03	2.79E+03	2.60E+03	2.51E+03	2.96E+03	3.08E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	8.74E+00	8.74E+00	6.01E+00	6.01E+00
PENRT	MJ_{NCV}	2.24E+03	2.79E+03	2.61E+03	2.52E+03	2.96E+03	3.09E+03
SM	kg	1.04E+02	1.46E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.05E+00	4.36E+00	4.33E+00	4.29E+00	2.39E+01	2.39E+01
HWD	kg	0.00E+00	0.00E+00	9.38E-06	9.38E-06	6.97E-06	6.97E-06
NHWD	kg	8.22E-02	9.47E-02	1.40E-01	1.38E-01	1.25E-01	1.28E-01
RWD	kg	0.00E+00	0.00E+00	1.63E-03	1.63E-03	1.20E-03	1.20E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

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Table 25. Environmental profiles (A1-A3), concrete for special applications, Geelong/Bellarine (VIC), per m^3

Indicator	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
GWP	**kg CO_2 eq**	**85**	**115**	**264**	**285**	**74**
ODP	kg CFC11 eq	3.33E-06	3.64E-06	7.03E-06	6.29E-06	1.52E-06
AP	kg SO_2 eq	0.295	0.390	1.09	1.01	0.253
EP	kg PO_4^{3-} eq	0.0527	0.0674	0.157	0.158	0.0433
POCP	kg C_2H_4 eq	0.0305	0.0347	0.0731	0.0669	0.0153
ADPE	kg Sb eq	7.37E-07	5.22E-07	2.82E-06	2.53E-06	5.71E-07
ADPF	MJ_{NCV}	760	940	2140	2140	550

Table 26. Environmental parameters (A1-A3), concrete for special applications, Geelong/Bellarine (VIC), per m^3

Parameter	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
PERE	MJ_{NCV}	1.11E+01	1.25E+01	2.62E+01	2.61E+01	7.64E+00
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.11E+01	1.25E+01	2.62E+01	2.61E+01	7.64E+00
PENRE	MJ_{NCV}	7.72E+02	9.52E+02	2.17E+03	2.15E+03	5.47E+02
PENRM	MJ_{NCV}	1.26E+00	0.00E+00	7.87E+00	6.88E+00	0.00E+00
PENRT	MJ_{NCV}	7.74E+02	9.52E+02	2.18E+03	2.15E+03	5.47E+02
SM	kg	0.00E+00	0.00E+00	1.33E+02	5.20E+01	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.88E+00	3.00E+00	4.07E+00	3.99E+00	2.37E+00
HWD	kg	1.61E-06	2.59E-07	8.44E-06	7.38E-06	0.00E+00
NHWD	kg	4.93E-02	4.72E-02	1.17E-01	1.12E-01	3.62E-02
RWD	kg	2.73E-04	3.87E-05	1.47E-03	1.29E-03	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Ballarat/Goldfields Region

Environmental profiles and parameters.

Product table list - Ballarat/Goldfields Region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower Carbon Concrete Products

Table No. 1 and 2
ENVISIA® 20 MPa
ENVISIA® 25 MPa
ENVISIA® 32 MPa
ENVISIA® 40 MPa
ENVISIA® 50 MPa
ENVISIA® 65 MPa

Table No. 3 and 4
ENVIROCRETE® PLUS 20 MPa
ENVIROCRETE® PLUS 25 MPa
ENVIROCRETE® PLUS 32 MPa
ENVIROCRETE® PLUS 40 MPa
ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 6
ENVIROCRETE® 40% 20 MPa
ENVIROCRETE® 40% 25 MPa
ENVIROCRETE® 40% 32 MPa
ENVIROCRETE® 40% 40 MPa
ENVIROCRETE® 40 % 50 MPa

Table No. 7 and 8
ENVIROCRETE® 30% 20 MPa
ENVIROCRETE® 30% 25 MPa
ENVIROCRETE® 30% 32 MPa
ENVIROCRETE® 30% 40 MPa
ENVIROCRETE® 30% 50 MPa

Table No. 9 and 10
ENVIROCRETE 20 MPa
ENVIROCRETE 25 MPa
ENVIROCRETE 32 MPa
ENVIROCRETE 40 MPa
ENVIROCRETE 50 MPa

Normal Class Concrete Products

Table No. 11 and 12
NORMAL CLASS GP BLEND 20 MPa
NORMAL CLASS GP BLEND 25 MPa
NORMAL CLASS GP BLEND 32 MPa
NORMAL CLASS GP BLEND 40 MPa
NORMAL CLASS GP BLEND 50 MPa

Table No. 13 and 14
NORMAL CLASS GP/FA BLEND 20 MPa
NORMAL CLASS GP/FA BLEND 25 MPa
NORMAL CLASS GP/FA BLEND 32 MPa
NORMAL CLASS GP/FA BLEND 40 MPa
NORMAL CLASS GP/FA BLEND 50 MPa

Table No. 15 and 16
NORMAL CLASS GP/GGBFS BLEND 20 MPa
NORMAL CLASS GP/GGBFS BLEND 25 MPa
NORMAL CLASS GP/GGBFS BLEND 32 MPa
NORMAL CLASS GP/GGBFS BLEND 40 MPa
NORMAL CLASS GP/GGBFS BLEND 50 MPa

Vic Roads Concrete Products

Table No. 17 and 18
VR330 32 MPa GP/FA
VR330 32 MPa GP/SLAG
VR400 40 MPa GP/FA
VR400 40 MPa GP/SLAG
VR400 40 MPa TREMIE GP/SLAG
VR400 40 MPa TREMIE/CFA GP/SLAG

Table No. 19 and 20
VR400 40 MPa SHOTCRETE
VR450 50 MPa GP/SLAG
VR450 50 MPa GP/FA
VR450 50 MPa TREMIE GP/SLAG
VR450 50 MPa TREMIE/CFA GP/SLAG

Concrete Products for Special Applications

Table No. 21 and 22
HIGH SLUMP 20 MPa
HIGH SLUMP 25 MPa
HIGH SLUMP 32 MPa
HIGH SLUMP 40 MPa
HIGH SLUMP 50 MPa
HIGH SLUMP 65 MPa
HIGH SLUMP 80 MPa

Table No. 23 and 24
TREMIE 40 MPa
TREMIE 50 MPa
POST TENSIONED 40 MPa 22@3
POST TENSIONED 40 MPa 22@4
SHOTCRETE 32 MPa
SHOTCRETE 40 MPa

Table No. 25 and 26
STABILISED SAND 3%
STABILISED SAND 5%
KERB MACHINE 320KG/M^3
KERB MACHINE 280KG/M^3
NO FINES 4%

Ballarat/Goldfields Region

GWP SUMMARY (kg CO_2 eq/m^3)

ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa	
171	186	213	289	325	383	
ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa		
195	219	237	275	341		
ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa		
232	255	287	340	417		
ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa		
257	282	319	379	467		
ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa		
206	232	246	296	370		
Normal GP blend 20 MPa	Normal GP blend 25 MPa	Normal GP blend 32 MPa	Normal GP blend 40 MPa	Normal GP blend 50 MPa		
262	292	329	388	496		
Normal GP/FA blend 20 MPa	Normal GP/FA blend 25 MPa	Normal GP/FA blend 32 MPa	Normal GP/FA blend 40 MPa	Normal GP/FA blend 50 MPa		
240	268	303	340	451		
Normal GP/ GGBFS blend 20 MPa	Normal GP/ GGBFS blend 25 MPa	Normal GP/ GGBFS blend 32 MPa	Normal GP/ GGBFS blend 40 MPa	Normal GP/ GGBFS blend 50 MPa		
228	256	284	332	421		
VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/ SLAG	VR400 40 MPa TREMIE/CFA GP/SLAG	
321	253	370	291	292	335	
VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/ SLAG	VR450 50 MPa TREMIE/CFA GP/SLAG		
427	324	424	325	349		
HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
280	306	347	409	475	494	520
TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa	
331	411	409	394	421	442	
KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%	STABILISED SAND 3%	STABILISED SAND 5%		
324	289	99	85	115		

Ballarat/Goldfields Region

Table 1. Environmental profiles (A1-A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
GWP	**kg CO_2 eq**	**171**	**186**	**213**	**289**	**325**	**383**
ODP	kg CFC11 eq	6.35E-06	6.71E-06	7.30E-06	8.59E-06	9.20E-06	1.05E-05
AP	kg SO_2 eq	0.874	0.959	1.07	1.37	1.53	1.83
EP	kg PO_4^{3-} eq	0.120	0.129	0.145	0.186	0.206	0.242
POCP	kg C_2H_4 eq	0.0619	0.0662	0.0727	0.0880	0.0957	0.111
ADPE	kg Sb eq	3.21E-06	3.62E-06	3.95E-06	3.24E-06	3.77E-06	3.98E-06
ADPF	MJ_{NCV}	1590	1720	1930	2450	2720	3190

Table 2. Environmental parameters (A1-A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
PERE	MJ_{NCV}	1.97E+01	2.16E+01	2.44E+01	2.81E+01	3.09E+01	3.52E+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}	1.97E+01	2.16E+01	2.44E+01	2.81E+01	3.09E+01	3.52E+01
PENRE	MJ_{NCV}	1.64E+03	1.78E+03	1.99E+03	2.51E+03	2.79E+03	3.26E+03
PENRM	MJ_{NCV}	9.02E+00	1.05E+01	1.17E+01	7.65E+00	9.73E+00	9.73E+00
PENRT	MJ_{NCV}	1.65E+03	1.79E+03	2.00E+03	2.52E+03	2.80E+03	3.27E+03
SM	kg	1.46E+02	1.66E+02	1.77E+02	2.08E+02	2.39E+02	3.07E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.81E+00	3.85E+00	3.98E+00	4.31E+00	4.23E+00	4.46E+00
HWD	kg	9.80E-06	1.14E-05	1.25E-05	8.20E-06	1.04E-05	1.04E-05
NHWD	kg	1.12E-01	1.25E-01	1.42E-01	1.33E-01	1.48E-01	1.58E-01
RWD	kg	1.70E-03	1.98E-03	2.18E-03	1.43E-03	1.82E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Ballarat/Goldfields Region

Table 3. Environmental profiles (A1–A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
GWP	**kg CO_2 eq**	**195**	**219**	**237**	**275**	**341**
ODP	kg CFC11 eq	6.25E-06	6.66E-06	7.13E-06	7.93E-06	9.15E-06
AP	kg SO_2 eq	0.881	0.983	1.06	1.24	1.53
EP	kg PO_4^{3-} eq	0.128	0.141	0.152	0.174	0.212
POCP	kg C_2H_4 eq	0.0617	0.0668	0.0718	0.0809	0.0956
ADPE	kg Sb eq	3.19E-06	3.60E-06	3.89E-06	3.09E-06	3.73E-06
ADPF	MJ_{NCV}	1670	1850	2000	2280	2780

Table 4. Environmental parameters (A1–A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
PERE	MJ_{NCV}	1.96E+01	2.18E+01	2.33E+01	2.50E+01	3.02E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.96E+01	2.18E+01	2.33E+01	2.50E+01	3.02E+01
PENRE	MJ_{NCV}	1.71E+03	1.89E+03	2.04E+03	2.32E+03	2.32E+03
PENRM	MJ_{NCV}	9.02E+00	1.05E+01	1.17E+01	7.65E+00	9.73E+00
PENRT	MJ_{NCV}	1.72E+03	1.90E+03	2.05E+03	2.33E+03	2.84E+03
SM	kg	1.12E+02	1.29E+02	1.40E+02	1.68E+02	2.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.85E+00	3.92E+00	4.00E+00	4.15E+00	4.29E+00
HWD	kg	9.80E-06	1.14E-05	1.25E-05	8.20E-06	1.04E-05
NHWD	kg	1.06E-01	1.19E-01	1.28E-01	1.15E-01	1.39E-01
RWD	kg	1.70E-03	1.98E-03	2.18E-03	1.43E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Ballarat/Goldfields Region

Table 5. Environmental profiles (A1–A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
GWP	**kg CO_2 eq**	**232**	**255**	**287**	**340**	**417**
ODP	kg CFC11 eq	6.16E-06	6.56E-06	7.01E-06	7.79E-06	8.98E-06
AP	kg SO_2 eq	0.903	1.00	1.10	1.28	1.58
EP	kg PO_4^{3-} eq	0.141	0.154	0.170	0.197	0.239
POCP	kg C_2H_4 eq	0.0622	0.0671	0.0725	0.0819	0.0967
ADPE	kg Sb eq	3.18E-06	3.59E-06	3.88E-06	3.09E-06	3.73E-06
ADPF	MJ_{NCV}	1820	1990	2200	2540	3090

Table 6. Environmental parameters (A1–A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
PERE	MJ_{NCV}	2.03E+01	2.22E+01	2.43E+01	2.63E+01	3.17E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.03E+01	2.22E+01	2.43E+01	2.63E+01	3.17E+01
PENRE	MJ_{NCV}	1.84E+03	2.01E+03	2.21E+03	2.55E+03	3.09E+03
PENRM	MJ_{NCV}	9.02E+00	1.05E+01	1.17E+01	7.65E+00	9.73E+00
PENRT	MJ_{NCV}	1.85E+03	2.02E+03	2.23E+03	2.56E+03	3.10E+03
SM	kg	6.45E+01	8.11E+01	7.49E+01	8.42E+01	1.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.97E+00	4.03E+00	4.15E+00	4.34E+00	4.48E+00
HWD	kg	9.80E-06	1.14E-05	1.25E-05	8.20E-06	1.04E-05
NHWD	kg	1.03E-01	1.14E-01	1.24E-01	1.11E-01	1.33E-01
RWD	kg	1.70E-03	1.98E-03	2.18E-03	1.43E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Ballarat/Goldfields Region

Table 7. Environmental profiles (A1-A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
GWP	**kg CO_2 eq**	**257**	**282**	**319**	**379**	**467**
ODP	kg CFC11 eq	6.15E-06	6.55E-06	7.00E-06	7.77E-06	8.96E-06
AP	kg SO_2 eq	0.930	1.03	1.13	1.32	1.63
EP	kg PO_4^{3-} eq	0.150	0.164	0.182	0.212	0.257
POCP	kg C_2H_4 eq	0.0630	0.0681	0.0736	0.0832	0.0984
ADPE	kg Sb eq	3.21E-06	3.62E-06	3.92E-06	3.13E-06	3.78E-06
ADPF	MJ_{NCV}	1930	2120	2350	2720	3310

Table 8. Environmental parameters (A1-A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
PERE	MJ_{NCV}	2.14E+01	2.34E+01	2.57E+01	2.80E+01	3.39E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.14E+01	2.34E+01	2.57E+01	2.80E+01	3.39E+01
PENRE	MJ_{NCV}	1.94E+03	2.12E+03	2.35E+03	2.71E+03	3.29E+03
PENRM	MJ_{NCV}	9.02E+00	1.05E+01	1.17E+01	7.65E+00	9.73E+00
PENRT	MJ_{NCV}	1.95E+03	2.13E+03	2.36E+03	2.72E+03	3.30E+03
SM	kg	3.33E+01	4.68E+01	3.43E+01	3.54E+01	5.41E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.05E+00	4.12E+00	4.25E+00	4.47E+00	4.64E+00
HWD	kg	9.80E-06	1.14E-05	1.25E-05	8.20E-06	1.04E-05
NHWD	kg	1.06E-01	1.18E-01	1.28E-01	1.15E-01	1.39E-01
RWD	kg	1.70E-03	1.98E-03	2.18E-03	1.43E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Ballarat/Goldfields Region

Table 9. Environmental profiles (A1–A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
GWP	**kg CO_2 eq**	**206**	**232**	**246**	**296**	**370**
ODP	kg CFC11 eq	6.64E-06	7.05E-06	7.30E-06	8.24E-06	9.26E-06
AP	kg SO_2 eq	0.896	1.004	1.06	1.27	1.58
EP	kg PO_4^{3-} eq	0.134	0.148	0.156	0.184	0.224
POCP	kg C_2H_4 eq	0.0649	0.0701	0.0730	0.0841	0.0976
ADPE	kg Sb eq	2.15E-06	2.43E-06	2.57E-06	3.03E-06	3.71E-06
ADPF	MJ_{NCV}	1720	1910	2010	2380	2910

Table 10. Environmental parameters (A1–A3), lower carbon concrete, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
PERE	MJ_{NCV}	1.78E+01	1.98E+01	2.08E+01	2.45E+01	2.99E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.78E+01	1.98E+01	2.08E+01	2.45E+01	2.99E+01
PENRE	MJ_{NCV}	1.76E+03	1.95E+03	2.05E+03	2.42E+03	2.95E+03
PENRM	MJ_{NCV}	4.81E+00	5.74E+00	6.23E+00	7.65E+00	9.73E+00
PENRT	MJ_{NCV}	1.76E+03	1.96E+03	2.06E+03	2.43E+03	2.96E+03
SM	kg	1.01E+02	1.16E+02	1.25E+02	1.54E+02	2.00E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.90E+00	3.97E+00	4.04E+00	4.25E+00	4.34E+00
HWD	kg	5.29E-06	6.28E-06	6.68E-06	8.20E-06	1.04E-05
NHWD	kg	7.73E-02	8.62E-02	9.01E-02	1.06E-01	1.28E-01
RWD	kg	9.17E-04	1.09E-03	1.16E-03	1.43E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Ballarat/Goldfields Region

Table 11. Environmental profiles (A1-A3), normal class concrete, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
GWP	**kg CO_2 eq**	**262**	**292**	**329**	**388**	**496**
ODP	kg CFC11 eq	5.92E-06	6.22E-06	6.80E-06	7.73E-06	8.83E-06
AP	kg SO_2 eq	0.891	0.986	1.11	1.30	1.63
EP	kg PO_4^{3-} eq	0.149	0.164	0.183	0.213	0.266
POCP	kg C_2H_4 eq	0.0607	0.0650	0.0718	0.0828	0.0981
ADPE	kg Sb eq	2.10E-06	2.29E-06	2.49E-06	3.07E-06	3.79E-06
ADPF	MJ_{NCV}	1900	2090	2340	2740	3420

Table 12. Environmental parameters (A1-A3), normal class concrete, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
PERE	MJ_{NCV}	1.99E+01	2.18E+01	2.41E+01	2.80E+01	3.49E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.99E+01	2.18E+01	2.41E+01	2.80E+01	3.49E+01
PENRE	MJ_{NCV}	1.90E+03	2.08E+03	2.33E+03	2.72E+03	3.38E+03
PENRM	MJ_{NCV}	4.21E+00	4.78E+00	5.45E+00	7.65E+00	9.73E+00
PENRT	MJ_{NCV}	1.90E+03	2.09E+03	2.33E+03	2.73E+03	3.39E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.11E+00	4.14E+00	4.29E+00	4.46E+00	4.80E+00
HWD	kg	4.64E-06	5.26E-06	5.85E-06	8.20E-06	1.04E-05
NHWD	kg	8.08E-02	8.78E-02	9.58E-02	1.16E-01	1.42E-01
RWD	kg	8.05E-04	9.12E-04	1.02E-03	1.43E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Ballarat/Goldfields Region

Table 13. Environmental profiles (A1-A3), normal class concrete, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
GWP	**kg CO_2 eq**	**240**	**268**	**303**	**340**	**451**
ODP	kg CFC11 eq	6.68E-06	7.16E-06	8.03E-06	9.12E-06	1.04E-05
AP	kg SO_2 eq	0.837	0.929	1.05	1.19	1.52
EP	kg PO_4^{3-} eq	0.142	0.157	0.176	0.196	0.252
POCP	kg C_2H_4 eq	0.0655	0.0711	0.0802	0.0924	0.108
ADPE	kg Sb eq	2.03E-06	2.45E-06	2.74E-06	1.66E-05	3.66E-06
ADPF	MJ_{NCV}	1820	2020	2280	2570	3260

Table 14. Environmental parameters (A1-A3), normal class concrete, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
PERE	MJ_{NCV}	1.81E+01	2.02E+01	2.23E+01	2.71E+01	3.15E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.81E+01	2.02E+01	2.23E+01	2.71E+01	3.15E+01
PENRE	MJ_{NCV}	1.83E+03	2.03E+03	2.28E+03	2.58E+03	3.25E+03
PENRM	MJ_{NCV}	4.21E+00	5.74E+00	7.10E+00	0.00E+00	9.73E+00
PENRT	MJ_{NCV}	1.84E+03	2.03E+03	2.29E+03	2.58E+03	3.26E+03
SM	kg	6.55E+01	7.49E+01	8.53E+01	1.25E+02	1.33E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.95E+00	4.07E+00	4.11E+00	4.22E+00	4.52E+00
HWD	kg	4.64E-06	6.28E-06	7.62E-06	1.44E-05	1.04E-05
NHWD	kg	7.70E-02	8.93E-02	9.98E-02	4.42E+00	1.35E-01
RWD	kg	8.05E-04	1.09E-03	1.33E-03	3.38E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Ballarat/Goldfields Region

Table 15. Environmental profiles (A1-A3), normal class concrete, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
GWP	**kg CO_2 eq**	**228**	**256**	**284**	**332**	**421**
ODP	kg CFC11 eq	6.34E-06	6.69E-06	7.09E-06	7.84E-06	8.86E-06
AP	kg SO_2 eq	0.870	0.969	1.07	1.24	1.55
EP	kg PO_4^{3-} eq	0.139	0.153	0.168	0.193	0.238
POCP	kg C_2H_4 eq	0.0628	0.0675	0.0724	0.0815	0.0956
ADPE	kg Sb eq	2.14E-06	2.42E-06	2.58E-06	3.02E-06	3.72E-06
ADPF	MJ_{NCV}	1780	1970	2160	2490	3080

Table 16. Environmental parameters (A1-A3), normal class concrete, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
PERE	MJ_{NCV}	1.84E+01	2.04E+01	2.22E+01	2.56E+01	3.17E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.84E+01	2.04E+01	2.22E+01	2.56E+01	3.17E+01
PENRE	MJ_{NCV}	1.80E+03	1.98E+03	2.17E+03	2.50E+03	3.08E+03
PENRM	MJ_{NCV}	4.81E+00	5.74E+00	6.23E+00	7.65E+00	9.73E+00
PENRT	MJ_{NCV}	1.80E+03	1.99E+03	2.18E+03	2.51E+03	3.09E+03
SM	kg	4.58E+01	5.30E+01	5.93E+01	7.07E+01	9.26E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.95E+00	4.02E+00	4.14E+00	4.34E+00	4.56E+00
HWD	kg	5.29E-06	6.28E-06	6.68E-06	8.20E-06	1.04E-05
NHWD	kg	7.92E-02	8.82E-02	9.42E-02	1.09E-01	1.33E-01
RWD	kg	9.17E-04	1.09E-03	1.16E-03	1.43E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Ballarat/Goldfields Region

Table 17. Environmental profiles (A1-A3), concrete for Vic Roads applications, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**321**	**253**	**370**	**291**	**292**	**335**
ODP	kg CFC11 eq	9.01E-06	8.55E-06	1.00E-05	9.47E-06	9.43E-06	1.01E-05
AP	kg SO_2 eq	1.14	1.21	1.30	1.38	1.39	1.55
EP	kg PO_4^{3-} eq	0.188	0.168	0.215	0.190	0.191	0.215
POCP	kg C_2H_4 eq	0.0905	0.0859	0.102	0.0961	0.0961	0.105
ADPE	kg Sb eq	1.89E-05	1.90E-05	1.89E-05	1.90E-05	2.11E-05	2.00E-05
ADPF	MJ_{NCV}	2470	2210	2810	2500	2520	2900

Table 18. Environmental parameters (A1-A3), concrete for Vic Roads applications, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	2.77E+01	2.64E+01	3.03E+01	2.88E+01	3.11E+01	3.91E+01
PERM	MJ_{NCV}	2.89E-02	2.89E-02	2.89E-02	2.89E-02	7.21E-02	9.62E-02
PERT	MJ_{NCV}	2.78E+01	2.65E+01	3.03E+01	2.88E+01	3.12E+01	3.92E+01
PENRE	MJ_{NCV}	2.48E+03	2.28E+03	2.82E+03	2.58E+03	2.59E+03	2.97E+03
PENRM	MJ_{NCV}	2.14E+00	2.14E+00	2.14E+00	2.14E+00	5.35E+00	2.90E+01
PENRT	MJ_{NCV}	2.49E+03	2.28E+03	2.82E+03	2.58E+03	2.60E+03	3.00E+03
SM	kg	8.84E+01	1.77E+02	1.04E+02	2.08E+02	2.08E+02	2.39E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.16E+00	4.03E+00	4.20E+00	4.05E+00	4.07E+00	4.05E+00
HWD	kg	2.14E-05	2.14E-05	2.14E-05	2.14E-05	3.03E-05	5.18E-05
NHWD	kg	4.91E+00	4.90E+00	4.91E+00	4.91E+00	5.20E+00	3.40E+00
RWD	kg	4.16E-03	4.16E-03	4.16E-03	4.16E-03	4.98E-03	7.91E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Ballarat/Goldfields Region

Table 19. Environmental profiles (A1-A3), concrete for Vic Roads applications, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**427**	**324**	**424**	**325**	**349**
ODP	kg CFC11 eq	1.16E-05	1.04E-05	1.09E-05	1.04E-05	1.04E-05
AP	kg SO_2 eq	1.61	1.54	1.48	1.54	1.61
EP	kg PO_4^{3-} eq	0.247	0.211	0.243	0.211	0.223
POCP	kg C_2H_4 eq	0.123	0.106	0.112	0.106	0.108
ADPE	kg Sb eq	1.94E-05	1.91E-05	1.90E-05	2.12E-05	2.07E-05
ADPF	MJ_{NCV}	3350	2770	3170	2790	3010

Table 20. Environmental parameters (A1-A3), concrete for Vic Roads applications, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	9.23E+01	3.10E+01	3.34E+01	3.33E+01	4.08E+01
PERM	MJ_{NCV}	2.89E-02	2.89E-02	2.89E-02	7.21E-02	9.62E-02
PERT	MJ_{NCV}	9.23E+01	3.10E+01	3.35E+01	3.34E+01	4.09E+01
PENRE	MJ_{NCV}	3.32E+03	2.85E+03	3.18E+03	2.86E+03	3.08E+03
PENRM	MJ_{NCV}	2.14E+00	2.14E+00	2.14E+00	5.35E+00	3.17E+01
PENRT	MJ_{NCV}	3.32E+03	2.85E+03	3.18E+03	2.87E+03	3.11E+03
SM	kg	7.28E+01	2.34E+02	1.04E+02	2.34E+02	2.50E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.05E+01	4.27E+00	4.48E+00	4.23E+00	4.11E+00
HWD	kg	2.14E-05	2.14E-05	2.14E-05	3.03E-05	5.47E-05
NHWD	kg	4.92E+00	4.91E+00	4.92E+00	5.20E+00	3.42E+00
RWD	kg	4.16E-03	4.16E-03	4.16E-03	4.98E-03	8.42E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Ballarat/Goldfields Region

Table 21. Environmental profiles (A1-A3), concrete for special applications, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	**kg CO_2 eq**	**280**	**306**	**347**	**409**	**475**	**494**	**520**
ODP	kg CFC11 eq	6.46E-06	6.77E-06	7.31E-06	8.02E-06	1.06E-05	1.16E-05	1.30E-05
AP	kg SO_2 eq	0.955	1.04	1.17	1.36	1.74	1.93	2.23
EP	kg PO_4^{3-} eq	0.160	0.173	0.193	0.224	0.270	0.288	0.314
POCP	kg C_2H_4 eq	0.0660	0.0701	0.0769	0.0863	0.113	0.124	0.139
ADPE	kg Sb eq	2.24E-06	2.45E-06	2.68E-06	3.15E-06	6.27E-06	1.28E-05	1.47E-05
ADPF	MJ_{NCV}	2040	2210	2480	2880	3500	3770	4160

Table 22. Environmental parameters (A1-A3), concrete for special applications, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ_{NCV}	2.09E+01	2.26E+01	2.52E+01	2.93E+01	3.63E+01	4.42E+01	4.97E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-02	1.44E-01	1.35E-01
PERT	MJ_{NCV}	2.09E+01	2.26E+01	2.52E+01	2.93E+01	3.63E+01	4.44E+01	4.98E+01
PENRE	MJ_{NCV}	2.03E+03	2.20E+03	2.46E+03	2.85E+03	3.50E+03	3.80E+03	4.21E+03
PENRM	MJ_{NCV}	5.03E+00	5.68E+00	6.34E+00	7.76E+00	1.14E+01	2.00E+01	2.91E+01
PENRT	MJ_{NCV}	2.04E+03	2.20E+03	2.47E+03	2.86E+03	3.51E+03	3.82E+03	4.24E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E+01	1.61E+02	2.96E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.11E+00	4.21E+00	4.34E+00	4.59E+00	4.68E+00	4.81E+00	4.83E+00
HWD	kg	5.39E-06	6.10E-06	6.80E-06	8.32E-06	1.90E-05	4.17E-05	5.01E-05
NHWD	kg	8.60E-02	9.33E-02	1.03E-01	1.20E-01	6.51E-01	1.71E+00	1.66E+00
RWD	kg	9.39E-04	1.06E-03	1.18E-03	1.45E-03	2.54E-03	4.94E-03	6.56E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	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	0.00E+00

Ballarat/Goldfields Region

Table 23. Environmental profiles (A1–A3), concrete for special applications, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
GWP	**kg CO_2 eq**	**331**	**411**	**409**	**394**	**421**	**442**
ODP	kg CFC11 eq	9.23E-06	1.06E-05	7.97E-06	7.81E-06	9.26E-06	9.52E-06
AP	kg SO_2 eq	1.32	1.65	1.36	1.32	1.50	1.57
EP	kg PO_4^{3-} eq	0.201	0.245	0.224	0.216	0.234	0.245
POCP	kg C_2H_4 eq	0.0928	0.109	0.0860	0.0838	0.101	0.104
ADPE	kg Sb eq	1.14E-06	1.37E-06	3.37E-06	3.34E-06	3.06E-06	3.11E-06
ADPF	MJ_{NCV}	2570	3140	2880	2780	3100	3240

Table 24. Environmental parameters (A1–A3), concrete for special applications, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
PERE	MJ_{NCV}	2.31E+01	2.84E+01	2.96E+01	2.87E+01	7.33E+01	7.45E+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}	2.31E+01	2.84E+01	2.96E+01	2.87E+01	7.33E+01	7.45E+01
PENRE	MJ_{NCV}	2.61E+03	3.18E+03	2.85E+03	2.76E+03	3.06E+03	3.19E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	8.74E+00	8.74E+00	6.01E+00	6.01E+00
PENRT	MJ_{NCV}	2.61E+03	3.18E+03	2.86E+03	2.77E+03	3.07E+03	3.20E+03
SM	kg	1.04E+02	1.46E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.29E+00	4.60E+00	4.53E+00	4.48E+00	2.40E+01	2.41E+01
HWD	kg	0.00E+00	0.00E+00	9.38E-06	9.38E-06	6.97E-06	6.97E-06
NHWD	kg	6.81E-02	8.08E-02	1.24E-01	1.22E-01	1.12E-01	1.15E-01
RWD	kg	0.00E+00	0.00E+00	1.63E-03	1.63E-03	1.20E-03	1.20E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Ballarat/Goldfields Region

Table 25. Environmental profiles (A1-A3), concrete for special applications, Ballarat/Goldfields (VIC), per m^3

Indicator	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
GWP	**kg CO_2 eq**	**85**	**115**	**324**	**289**	**99**
ODP	kg CFC11 eq	3.92E-06	4.30E-06	8.82E-06	8.31E-06	4.73E-06
AP	kg SO_2 eq	0.335	0.433	1.23	1.11	0.395
EP	kg PO_4^{3-} eq	0.0612	0.0763	0.194	0.176	0.0711
POCP	kg C_2H_4 eq	0.0343	0.0390	0.0886	0.0824	0.0415
ADPE	kg Sb eq	8.74E-07	6.59E-07	2.65E-06	2.36E-06	4.10E-07
ADPF	MJ_{NCV}	760	950	2500	2260	880

Table 26. Environmental parameters (A1-A3), concrete for special applications, Ballarat/Goldfields (VIC), per m^3

Parameter	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
PERE	MJ_{NCV}	7.95E+00	9.39E+00	2.04E+01	2.52E+01	2.53E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	7.95E+00	9.39E+00	2.04E+01	2.52E+01	2.53E+01
PENRE	MJ_{NCV}	7.85E+02	9.71E+02	7.61E+02	1.18E+03	1.24E+03
PENRM	MJ_{NCV}	1.26E+00	0.00E+00	9.84E-01	2.24E+00	3.17E+00
PENRT	MJ_{NCV}	7.86E+02	9.71E+02	7.62E+02	1.18E+03	1.24E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.20E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.01E+00	3.13E+00	3.43E+00	3.50E+00	3.48E+00
HWD	kg	1.61E-06	2.59E-07	1.83E-06	3.18E-06	4.18E-06
NHWD	kg	3.69E-02	3.48E-02	3.52E-02	5.59E-02	6.07E-02
RWD	kg	2.73E-04	3.87E-05	3.00E-04	5.34E-04	7.08E-04
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Loddon/Goldfields Region

Environmental profiles and parameters.

Product table list
Loddon/Goldfields Region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower Carbon Concrete Products

Table No. 1 and 2
- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa
- ENVISIA® 65 MPa

Table No. 3 and 4
- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 6
- ENVIROCRETE® 40% 20 MPa
- ENVIROCRETE® 40% 25 MPa
- ENVIROCRETE® 40% 32 MPa
- ENVIROCRETE® 40% 40 MPa
- ENVIROCRETE® 40 % 50 MPa

Table No. 7 and 8
- ENVIROCRETE® 30% 20 MPa
- ENVIROCRETE® 30% 25 MPa
- ENVIROCRETE® 30% 32 MPa
- ENVIROCRETE® 30% 40 MPa
- ENVIROCRETE® 30% 50 MPa

Table No. 9 and 10
- ENVIROCRETE 20 MPa
- ENVIROCRETE 25 MPa
- ENVIROCRETE 32 MPa
- ENVIROCRETE 40 MPa
- ENVIROCRETE 50 MPa

Normal Class Concrete Products

Table No. 11 and 12
- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 13 and 14
- NORMAL CLASS GP/FA BLEND 20 MPa
- NORMAL CLASS GP/FA BLEND 25 MPa
- NORMAL CLASS GP/FA BLEND 32 MPa
- NORMAL CLASS GP/FA BLEND 40 MPa
- NORMAL CLASS GP/FA BLEND 50 MPa

Table No. 15 and 16
- NORMAL CLASS GP/GGBFS BLEND 20 MPa
- NORMAL CLASS GP/GGBFS BLEND 25 MPa
- NORMAL CLASS GP/GGBFS BLEND 32 MPa
- NORMAL CLASS GP/GGBFS BLEND 40 MPa
- NORMAL CLASS GP/GGBFS BLEND 50 MPa

Vic Roads Concrete Products

Table No. 17 and 18
- VR330 32 MPa GP/FA
- VR330 32 MPa GP/SLAG
- VR400 40 MPa GP
- VR400 40 MPa GP/SLAG
- VR400 40 MPa TREMIE GP/SLAG
- VR400 40 MPa TREMIE/CFA GP/SLAG

Table No. 19 and 20
- VR450 50 MPa GP/SLAG
- VR450 50 MPa GP/FA
- VR450 50MPA GP/SLAG
- VR450 50 MPa TREMIE/CFA GP/SLAG

Concrete Products for Special Applications

Table No. 21 and 22
- HIGH SLUMP 20 MPa
- HIGH SLUMP 25 MPa
- HIGH SLUMP 32 MPa
- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 23 and 24
- TREMIE 40 MPa
- TREMIE 50 MPa
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa
- SHOTCRETE 40 MPa

Table No. 25 and 26
- STABILISED SAND 3%
- STABILISED SAND 5%
- KERB MACHINE 320KG/M^3
- KERB MACHINE 280KG/M^3
- NO FINES 4%

Loddon/Goldfields Region

GWP SUMMARY (kg CO_2 eq/m^3)

ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa	
165	180	205	284	320	379	
ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa		
189	212	230	270	336		
ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa		
226	249	280	335	413		
ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa		
251	277	313	375	463		
ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa		
194	218	236	282	333		
Normal GP blend 20 MPa	Normal GP blend 25 MPa	Normal GP blend 32 MPa	Normal GP blend 40 MPa	Normal GP blend 50 MPa		
274	310	336	405	481		
Normal GP/FA blend 20 MPa	Normal GP/FA blend 25 MPa	Normal GP/FA blend 32 MPa	Normal GP/FA blend 40 MPa	Normal GP/FA blend 50 MPa		
235	281	301	362	399		
Normal GP/ GGBFS blend 20 MPa	Normal GP/ GGBFS blend 25 MPa	Normal GP/ GGBFS blend 32 MPa	Normal GP/ GGBFS blend 40 MPa	Normal GP/ GGBFS blend 50 MPa		
244	276	298	359	425		
VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/ SLAG	VR400 40 MPa TREMIE/CFA GP/SLAG	
321	254	468	275	331	320	
VR450 50 MPa TREMIE GP/ SLAG	VR450 50 MPa TREMIE/CFA GP/SLAG	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA			
308	334	307	406			
HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
289	321	352	420	467	481	506
TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa	
316	397	405	383	425	446	
KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%	STABILISED SAND 3%	STABILISED SAND 5%		
312	278	82	72	103		

Loddon/Goldfields Region

Table 1. Environmental profiles (A1-A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
GWP	**kg CO_2 eq**	**165**	**180**	**205**	**284**	**320**	**379**
ODP	kg CFC11 eq	5.67E-06	6.08E-06	6.55E-06	7.88E-06	8.44E-06	9.93E-06
AP	kg SO_2 eq	0.831	0.918	1.03	1.33	1.49	1.80
EP	kg PO_4^{3-} eq	0.111	0.120	0.134	0.177	0.197	0.234
POCP	kg C_2H_4 eq	0.0566	0.0611	0.0667	0.0826	0.0898	0.106
ADPE	kg Sb eq	2.09E-06	2.33E-06	2.56E-06	3.11E-06	3.61E-06	3.82E-06
ADPF	MJ_{NCV}	1500	1630	1830	2390	2650	3140

Table 2. Environmental parameters (A1-A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
PERE	MJ_{NCV}	1.84E+01	2.01E+01	2.27E+01	2.82E+01	3.12E+01	3.55E+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}	1.84E+01	2.01E+01	2.27E+01	2.82E+01	3.12E+01	3.55E+01
PENRE	MJ_{NCV}	1.55E+03	1.69E+03	1.88E+03	2.44E+03	2.71E+03	3.21E+03
PENRM	MJ_{NCV}	5.14E+00	5.90E+00	6.45E+00	7.87E+00	9.51E+00	9.51E+00
PENRT	MJ_{NCV}	1.55E+03	1.69E+03	1.89E+03	2.45E+03	2.72E+03	3.22E+03
SM	kg	1.46E+02	1.66E+02	1.77E+02	2.08E+02	2.39E+02	3.07E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.65E+00	3.68E+00	3.84E+00	4.16E+00	4.24E+00	4.51E+00
HWD	kg	5.51E-06	6.33E-06	6.92E-06	8.44E-06	1.02E-05	1.02E-05
NHWD	kg	9.67E-02	1.06E-01	1.20E-01	1.40E-01	1.55E-01	1.65E-01
RWD	kg	9.59E-04	1.10E-03	1.20E-03	1.47E-03	1.78E-03	1.78E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Loddon/Goldfields Region

Table 3. Environmental profiles (A1–A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
GWP	**kg CO_2 eq**	**189**	**212**	**230**	**270**	**336**
ODP	kg CFC11 eq	5.62E-06	6.09E-06	6.42E-06	7.20E-06	8.35E-06
AP	kg SO_2 eq	0.840	0.944	1.02	1.20	1.49
EP	kg PO_4^{3-} eq	0.119	0.132	0.142	0.165	0.202
POCP	kg C_2H_4 eq	0.0568	0.0623	0.0662	0.0754	0.0894
ADPE	kg Sb eq	2.07E-06	2.32E-06	2.50E-06	2.97E-06	3.56E-06
ADPF	MJ_{NCV}	1590	1770	1900	2210	2700

Table 4. Environmental parameters (A1–A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
PERE	MJ_{NCV}	1.83E+01	2.03E+01	2.17E+01	2.51E+01	3.04E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.83E+01	2.03E+01	2.17E+01	2.51E+01	3.04E+01
PENRE	MJ_{NCV}	1.62E+03	1.81E+03	1.94E+03	2.25E+03	2.75E+03
PENRM	MJ_{NCV}	5.14E+00	5.90E+00	6.45E+00	7.87E+00	9.51E+00
PENRT	MJ_{NCV}	1.63E+03	1.81E+03	1.95E+03	2.26E+03	2.76E+03
SM	kg	1.12E+02	1.29E+02	1.40E+02	1.68E+02	2.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.69E+00	3.76E+00	3.86E+00	4.02E+00	4.25E+00
HWD	kg	5.51E-06	6.33E-06	6.92E-06	8.44E-06	1.02E-05
NHWD	kg	9.04E-02	9.94E-02	1.06E-01	1.22E-01	1.45E-01
RWD	kg	9.59E-04	1.10E-03	1.20E-03	1.47E-03	1.78E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Loddon/Goldfields Region

Table 5. Environmental profiles (A1–A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
GWP	**kg CO_2 eq**	**226**	**249**	**280**	**335**	**413**
ODP	kg CFC11 eq	5.59E-06	6.05E-06	6.39E-06	7.17E-06	8.31E-06
AP	kg SO_2 eq	0.865	0.97	1.06	1.25	1.54
EP	kg PO_4^{3-} eq	0.132	0.145	0.161	0.189	0.230
POCP	kg C_2H_4 eq	0.0579	0.0633	0.0678	0.0774	0.0917
ADPE	kg Sb eq	2.06E-06	2.31E-06	2.50E-06	2.97E-06	3.56E-06
ADPF	MJ_{NCV}	1740	1920	2110	2490	3030

Table 6. Environmental parameters (A1–A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
PERE	MJ_{NCV}	1.89E+01	2.07E+01	2.27E+01	2.64E+01	3.19E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.89E+01	2.07E+01	2.27E+01	2.64E+01	3.19E+01
PENRE	MJ_{NCV}	1.76E+03	1.93E+03	2.12E+03	2.49E+03	3.03E+03
PENRM	MJ_{NCV}	5.14E+00	5.90E+00	6.45E+00	7.87E+00	9.51E+00
PENRT	MJ_{NCV}	1.76E+03	1.94E+03	2.13E+03	2.50E+03	3.04E+03
SM	kg	6.45E+01	8.11E+01	7.49E+01	8.42E+01	1.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.78E+00	3.84E+00	3.99E+00	4.18E+00	4.44E+00
HWD	kg	5.51E-06	6.33E-06	6.92E-06	8.44E-06	1.02E-05
NHWD	kg	8.70E-02	9.47E-02	1.02E-01	1.18E-01	1.39E-01
RWD	kg	9.59E-04	1.10E-03	1.20E-03	1.47E-03	1.78E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Loddon/Goldfields Region

Table 7. Environmental profiles (A1-A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
GWP	**kg CO_2 eq**	**251**	**277**	**313**	**375**	**463**
ODP	kg CFC11 eq	5.63E-06	6.09E-06	6.44E-06	7.23E-06	8.38E-06
AP	kg SO_2 eq	0.893	1.00	1.09	1.29	1.60
EP	kg PO_4^{3-} eq	0.142	0.156	0.173	0.204	0.249
POCP	kg C_2H_4 eq	0.0592	0.0647	0.0694	0.0794	0.0942
ADPE	kg Sb eq	2.09E-06	2.34E-06	2.53E-06	3.01E-06	3.61E-06
ADPF	MJ_{NCV}	1860	2050	2270	2670	3260

Table 8. Environmental parameters (A1-A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
PERE	MJ_{NCV}	2.01E+01	2.19E+01	2.41E+01	2.82E+01	3.41E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.01E+01	2.19E+01	2.41E+01	2.82E+01	3.41E+01
PENRE	MJ_{NCV}	1.86E+03	2.05E+03	2.26E+03	2.66E+03	3.23E+03
PENRM	MJ_{NCV}	5.14E+00	5.90E+00	6.45E+00	7.87E+00	9.51E+00
PENRT	MJ_{NCV}	1.87E+03	2.06E+03	2.27E+03	2.66E+03	3.24E+03
SM	kg	3.33E+01	4.68E+01	3.43E+01	3.54E+01	5.41E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.86E+00	3.93E+00	4.09E+00	4.31E+00	4.60E+00
HWD	kg	5.51E-06	6.33E-06	6.92E-06	8.44E-06	1.02E-05
NHWD	kg	9.01E-02	9.81E-02	1.06E-01	1.23E-01	1.45E-01
RWD	kg	9.59E-04	1.10E-03	1.20E-03	1.47E-03	1.78E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Loddon/Goldfields Region

Table 9. Environmental profiles (A1–A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
GWP	**kg CO_2 eq**	**194**	**218**	**236**	**282**	**333**
ODP	kg CFC11 eq	5.49E-06	5.95E-06	6.28E-06	7.13E-06	7.88E-06
AP	kg SO_2 eq	0.819	0.922	1.00	1.19	1.40
EP	kg PO_4^{3-} eq	0.120	0.133	0.143	0.169	0.197
POCP	kg C_2H_4 eq	0.0557	0.0612	0.0650	0.0750	0.0847
ADPE	kg Sb eq	2.18E-06	2.45E-06	2.65E-06	3.14E-06	3.72E-06
ADPF	MJ_{NCV}	1590	1770	1900	2240	2610

Table 10. Environmental parameters (A1–A3), lower carbon concrete, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
PERE	MJ_{NCV}	1.77E+01	1.96E+01	2.09E+01	2.45E+01	2.84E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.77E+01	1.96E+01	2.09E+01	2.45E+01	2.84E+01
PENRE	MJ_{NCV}	1.61E+03	1.80E+03	1.93E+03	2.28E+03	2.64E+03
PENRM	MJ_{NCV}	5.78E+00	6.64E+00	7.26E+00	8.85E+00	1.07E+01
PENRT	MJ_{NCV}	1.62E+03	1.81E+03	1.94E+03	2.28E+03	2.65E+03
SM	kg	9.78E+01	1.12E+02	1.23E+02	1.50E+02	1.81E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.72E+00	3.78E+00	3.87E+00	4.09E+00	4.19E+00
HWD	kg	6.25E-06	7.17E-06	7.83E-06	9.49E-06	1.15E-05
NHWD	kg	8.69E-02	9.53E-02	1.02E-01	1.17E-01	1.35E-01
RWD	kg	1.09E-03	1.25E-03	1.36E-03	1.65E-03	2.00E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Loddon/Goldfields Region

Table 11. Environmental profiles (A1-A3), normal class concrete, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
GWP	**kg CO_2 eq**	**274**	**310**	**336**	**405**	**481**
ODP	kg CFC11 eq	5.59E-06	6.07E-06	6.41E-06	7.29E-06	8.08E-06
AP	kg SO_2 eq	0.907	1.023	1.11	1.32	1.56
EP	kg PO_4^{3-} eq	0.150	0.168	0.181	0.216	0.253
POCP	kg C_2H_4 eq	0.0597	0.0658	0.0701	0.0812	0.0921
ADPE	kg Sb eq	2.26E-06	2.54E-06	2.75E-06	3.26E-06	3.86E-06
ADPF	MJ_{NCV}	1960	2200	2370	2820	3310

Table 12. Environmental parameters (A1-A3), normal class concrete, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
PERE	MJ_{NCV}	2.12E+01	2.36E+01	2.53E+01	2.98E+01	3.48E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.12E+01	2.36E+01	2.53E+01	2.98E+01	3.48E+01
PENRE	MJ_{NCV}	1.95E+03	2.18E+03	2.35E+03	2.79E+03	3.26E+03
PENRM	MJ_{NCV}	5.78E+00	6.64E+00	7.26E+00	8.85E+00	1.07E+01
PENRT	MJ_{NCV}	1.95E+03	2.19E+03	2.36E+03	2.79E+03	3.27E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.97E+00	4.06E+00	4.19E+00	4.48E+00	4.65E+00
HWD	kg	6.25E-06	7.17E-06	7.83E-06	9.49E-06	1.15E-05
NHWD	kg	9.65E-02	1.06E-01	1.14E-01	1.32E-01	1.53E-01
RWD	kg	1.09E-03	1.25E-03	1.36E-03	1.65E-03	2.00E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Loddon/Goldfields Region

Table 13. Environmental profiles (A1–A3), normal class concrete, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
GWP	**kg CO_2 eq**	**235**	**281**	**301**	**362**	**399**
ODP	kg CFC11 eq	5.93E-06	6.71E-06	7.02E-06	8.15E-06	8.29E-06
AP	kg SO_2 eq	0.798	0.946	1.01	1.21	1.32
EP	kg PO_4^{3-} eq	0.134	0.158	0.168	0.200	0.216
POCP	kg C_2H_4 eq	0.0602	0.0693	0.0730	0.0856	0.089
ADPE	kg Sb eq	2.26E-06	2.69E-06	2.87E-06	3.15E-06	3.69E-06
ADPF	MJ_{NCV}	1770	2080	2210	2630	2850

Table 14. Environmental parameters (A1–A3), normal class concrete, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
PERE	MJ_{NCV}	1.87E+01	2.18E+01	2.30E+01	2.68E+01	2.93E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.87E+01	2.18E+01	2.30E+01	2.68E+01	2.93E+01
PENRE	MJ_{NCV}	1.77E+03	2.08E+03	2.21E+03	2.62E+03	2.83E+03
PENRM	MJ_{NCV}	6.27E+00	7.62E+00	8.24E+00	8.85E+00	1.09E+01
PENRT	MJ_{NCV}	1.77E+03	2.08E+03	2.21E+03	2.63E+03	2.84E+03
SM	kg	6.66E+01	8.01E+01	8.74E+01	1.07E+02	1.04E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.75E+00	3.94E+00	3.98E+00	4.29E+00	3.99E+00
HWD	kg	6.73E-06	8.23E-06	8.84E-06	9.49E-06	1.17E-05
NHWD	kg	9.26E-02	1.07E-01	1.13E-01	1.26E-01	1.40E-01
RWD	kg	1.17E-03	1.43E-03	1.54E-03	1.65E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Loddon/Goldfields Region

Table 15. Environmental profiles (A1-A3), normal class concrete, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
GWP	**kg CO_2 eq**	**244**	**276**	**298**	**359**	**425**
ODP	kg CFC11 eq	5.55E-06	6.02E-06	6.36E-06	7.23E-06	8.00E-06
AP	kg SO_2 eq	0.874	0.986	1.06	1.27	1.50
EP	kg PO_4^{3-} eq	0.138	0.155	0.167	0.198	0.232
POCP	kg C_2H_4 eq	0.0582	0.0641	0.0681	0.0789	0.0893
ADPE	kg Sb eq	2.23E-06	2.50E-06	2.71E-06	3.22E-06	3.81E-06
ADPF	MJ_{NCV}	1820	2040	2190	2600	3040

Table 16. Environmental parameters (A1-A3), normal class concrete, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
PERE	MJ_{NCV}	1.99E+01	2.21E+01	2.36E+01	2.78E+01	3.24E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.99E+01	2.21E+01	2.36E+01	2.78E+01	3.24E+01
PENRE	MJ_{NCV}	1.82E+03	2.04E+03	2.19E+03	2.59E+03	3.03E+03
PENRM	MJ_{NCV}	5.78E+00	6.64E+00	7.26E+00	8.85E+00	1.07E+01
PENRT	MJ_{NCV}	1.83E+03	2.05E+03	2.20E+03	2.60E+03	3.04E+03
SM	kg	3.64E+01	4.16E+01	4.68E+01	5.62E+01	6.86E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.87E+00	3.96E+00	4.07E+00	4.33E+00	4.48E+00
HWD	kg	6.25E-06	7.17E-06	7.83E-06	9.49E-06	1.15E-05
NHWD	kg	9.29E-02	1.02E-01	1.09E-01	1.27E-01	1.46E-01
RWD	kg	1.09E-03	1.25E-03	1.36E-03	1.65E-03	2.00E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Loddon/Goldfields Region

Table 17. Environmental profiles (A1-A3), concrete for Vic Roads applications, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**321**	**254**	**468**	**331**	**275**	**320**
ODP	kg CFC11 eq	8.54E-06	8.24E-06	1.04E-05	1.02E-05	7.18E-06	8.06E-06
AP	kg SO_2 eq	1.11	1.19	1.59	1.43	1.28	1.46
EP	kg PO_4^{3-} eq	0.183	0.163	0.256	0.204	0.169	0.196
POCP	kg C_2H_4 eq	0.0878	0.0843	0.112	0.1042	0.0779	0.088
ADPE	kg Sb eq	2.01E-05	2.02E-05	2.19E-05	1.66E-05	2.11E-05	2.00E-05
ADPF	MJ_{NCV}	2470	2230	3400	2740	2290	2700

Table 18. Environmental parameters (A1-A3), concrete for Vic Roads applications, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	3.00E+01	2.87E+01	3.68E+01	2.91E+01	3.10E+01	3.93E+01
PERM	MJ_{NCV}	2.89E-02	2.89E-02	0.00E+00	0.00E+00	7.21E-02	9.62E-02
PERT	MJ_{NCV}	3.00E+01	2.87E+01	3.68E+01	2.91E+01	3.11E+01	3.94E+01
PENRE	MJ_{NCV}	2.48E+03	2.29E+03	3.39E+03	2.80E+03	2.34E+03	2.74E+03
PENRM	MJ_{NCV}	7.92E+00	7.92E+00	0.00E+00	0.00E+00	5.35E+00	2.90E+01
PENRT	MJ_{NCV}	2.48E+03	2.29E+03	3.39E+03	2.80E+03	2.35E+03	2.77E+03
SM	kg	8.84E+01	1.77E+02	0.00E+00	1.66E+02	2.08E+02	2.39E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.15E+00	4.02E+00	4.71E+00	4.28E+00	3.71E+00	3.98E+00
HWD	kg	2.76E-05	2.76E-05	1.93E-05	1.44E-05	3.03E-05	5.18E-05
NHWD	kg	4.94E+00	4.94E+00	5.90E+00	4.43E+00	5.20E+00	3.41E+00
RWD	kg	5.24E-03	5.24E-03	4.51E-03	3.38E-03	4.98E-03	7.91E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Loddon/Goldfields Region

Table 19. Environmental profiles (A1–A3), concrete for Vic Roads applications, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**307**	**406**	**308**	**334**
ODP	kg CFC11 eq	8.09E-06	8.47E-06	8.06E-06	8.34E-06
AP	kg SO_2 eq	1.43	1.37	1.43	1.51
EP	kg PO_4^{3-} eq	0.189	0.220	0.189	0.204
POCP	kg C_2H_4 eq	0.0870	0.0922	0.0872	0.0918
ADPE	kg Sb eq	1.92E-05	1.91E-05	2.13E-05	2.07E-05
ADPF	MJ_{NCV}	2540	2920	2560	2810

Table 20. Environmental parameters (A1–A3), concrete for Vic Roads applications, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	3.12E+01	3.37E+01	3.35E+01	4.10E+01
PERM	MJ_{NCV}	2.89E-02	2.89E-02	7.21E-02	9.62E-02
PERT	MJ_{NCV}	3.13E+01	3.37E+01	3.36E+01	4.11E+01
PENRE	MJ_{NCV}	2.60E+03	2.91E+03	2.61E+03	2.86E+03
PENRM	MJ_{NCV}	2.14E+00	2.14E+00	5.35E+00	3.17E+01
PENRT	MJ_{NCV}	2.60E+03	2.91E+03	2.62E+03	2.89E+03
SM	kg	2.34E+02	1.04E+02	2.34E+02	2.50E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.18E+00	4.39E+00	4.14E+00	4.04E+00
HWD	kg	2.14E-05	2.14E-05	3.03E-05	5.47E-05
NHWD	kg	4.92E+00	4.93E+00	5.21E+00	3.42E+00
RWD	kg	4.16E-03	4.16E-03	4.98E-03	8.42E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Loddon/Goldfields Region

Table 21. Environmental profiles (A1-A3), concrete for special applications, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	**kg CO_2 eq**	**289**	**321**	**352**	**420**	**467**	**481**	**506**
ODP	kg CFC11 eq	5.79E-06	6.18E-06	6.56E-06	7.50E-06	8.75E-06	9.74E-06	1.14E-05
AP	kg SO_2 eq	0.957	1.06	1.15	1.37	1.66	1.84	2.14
EP	kg PO_4^{3-} eq	0.158	0.173	0.189	0.223	0.255	0.270	0.296
POCP	kg C_2H_4 eq	0.0623	0.0673	0.0722	0.0838	0.099	0.109	0.126
ADPE	kg Sb eq	2.38E-06	2.66E-06	2.86E-06	3.39E-06	1.22E-05	1.23E-05	1.25E-05
ADPF	MJ_{NCV}	2060	2270	2470	2920	3390	3600	3950

Table 22. Environmental parameters (A1-A3), concrete for special applications, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ_{NCV}	2.22E+01	2.43E+01	2.63E+01	3.08E+01	4.25E+01	4.44E+01	4.74E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-01	1.20E-01	1.20E-01
PERT	MJ_{NCV}	2.22E+01	2.43E+01	2.63E+01	3.08E+01	4.27E+01	4.45E+01	4.75E+01
PENRE	MJ_{NCV}	2.05E+03	2.25E+03	2.44E+03	2.88E+03	3.37E+03	3.61E+03	4.00E+03
PENRM	MJ_{NCV}	6.15E+00	6.88E+00	7.62E+00	9.22E+00	2.22E+01	2.22E+01	2.22E+01
PENRT	MJ_{NCV}	2.05E+03	2.25E+03	2.45E+03	2.89E+03	3.40E+03	3.63E+03	4.02E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E+01	1.61E+02	2.96E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.02E+00	4.12E+00	4.23E+00	4.47E+00	4.57E+00	4.70E+00	4.73E+00
HWD	kg	6.59E-06	7.64E-06	8.18E-06	9.89E-06	4.07E-05	4.07E-05	4.07E-05
NHWD	kg	1.01E-01	1.11E-01	1.18E-01	1.36E-01	1.47E+00	1.47E+00	1.48E+00
RWD	kg	1.15E-03	1.32E-03	1.42E-03	1.72E-03	5.15E-03	5.15E-03	5.15E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	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	0.00E+00

Loddon/Goldfields Region

Table 23. Environmental profiles (A1-A3), concrete for special applications, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
GWP	**kg CO_2 eq**	**316**	**397**	**405**	**383**	**425**	**446**
ODP	kg CFC11 eq	7.17E-06	8.69E-06	7.32E-06	6.93E-06	9.72E-06	9.94E-06
AP	kg SO_2 eq	1.22	1.55	1.32	1.25	1.50	1.57
EP	kg PO_4^{3-} eq	0.182	0.227	0.216	0.205	0.234	0.244
POCP	kg C_2H_4 eq	0.0763	0.094	0.0814	0.0770	0.106	0.109
ADPE	kg Sb eq	1.17E-06	1.40E-06	3.05E-06	3.18E-06	2.93E-06	2.98E-06
ADPF	MJ_{NCV}	2370	2950	2820	2670	3170	3300

Table 24. Environmental parameters (A1-A3), concrete for special applications, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
PERE	MJ_{NCV}	2.34E+01	2.86E+01	2.96E+01	2.85E+01	7.37E+01	7.49E+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}	2.34E+01	2.86E+01	2.96E+01	2.85E+01	7.37E+01	7.49E+01
PENRE	MJ_{NCV}	2.38E+03	2.97E+03	2.79E+03	2.64E+03	3.13E+03	3.25E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	7.87E+00	8.61E+00	6.01E+00	6.01E+00
PENRT	MJ_{NCV}	2.38E+03	2.97E+03	2.79E+03	2.65E+03	3.14E+03	3.26E+03
SM	kg	1.04E+02	1.46E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.21E+00	4.52E+00	4.52E+00	4.41E+00	2.40E+01	2.41E+01
HWD	kg	0.00E+00	0.00E+00	8.44E-06	9.23E-06	6.97E-06	6.97E-06
NHWD	kg	7.54E-02	8.82E-02	1.27E-01	1.28E-01	1.18E-01	1.21E-01
RWD	kg	0.00E+00	0.00E+00	1.47E-03	1.61E-03	1.20E-03	1.20E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

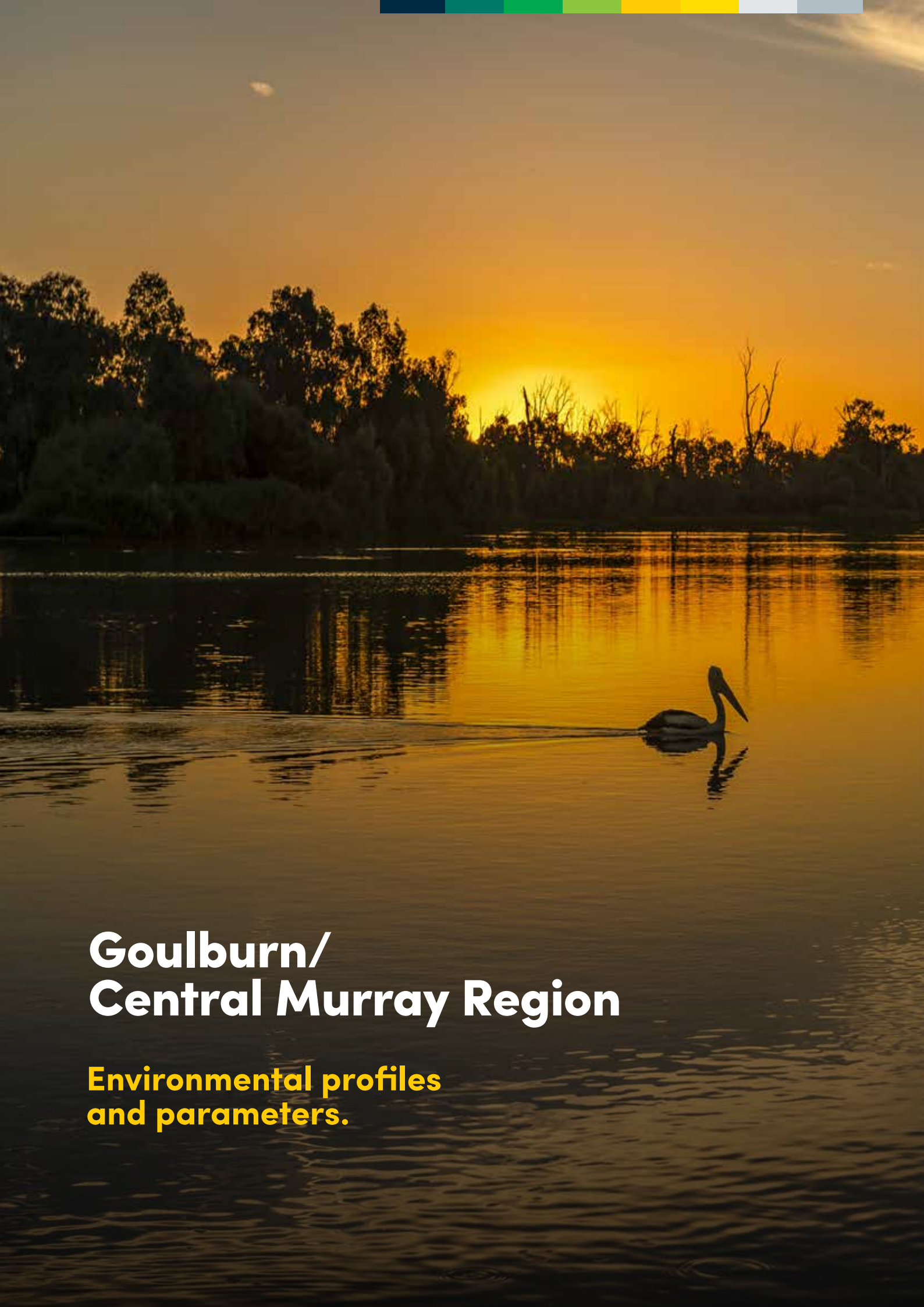
Loddon/Goldfields Region

Table 25. Environmental profiles (A1-A3), concrete for special applications, Loddon/Goldfields (VIC), per m^3

Indicator	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
GWP	**kg CO_2 eq**	**72**	**103**	**312**	**278**	**82**
ODP	kg CFC11 eq	2.28E-06	2.71E-06	8.78E-06	8.16E-06	2.43E-06
AP	kg SO_2 eq	0.254	0.353	1.20	1.07	0.290
EP	kg PO_4^{3-} eq	0.0444	0.0600	0.185	0.166	0.0507
POCP	kg C_2H_4 eq	0.0214	0.0266	0.0890	0.0818	0.0230
ADPE	kg Sb eq	5.72E-07	3.58E-07	2.91E-06	2.58E-06	5.81E-07
ADPF	MJ_{NCV}	600	790	2450	2210	650

Table 26. Environmental parameters (A1-A3), concrete for special applications, Loddon/Goldfields (VIC), per m^3

Parameter	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
PERE	MJ_{NCV}	7.53E+00	8.98E+00	2.44E+01	2.20E+01	8.17E+00
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	7.53E+00	8.98E+00	2.44E+01	2.20E+01	8.17E+00
PENRE	MJ_{NCV}	6.04E+02	7.97E+02	2.48E+03	2.24E+03	6.59E+02
PENRM	MJ_{NCV}	1.26E+00	0.00E+00	7.87E+00	6.88E+00	0.00E+00
PENRT	MJ_{NCV}	6.05E+02	7.97E+02	2.49E+03	2.25E+03	6.59E+02
SM	kg	0.00E+00	0.00E+00	8.32E+01	7.28E+01	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.79E+00	2.91E+00	4.10E+00	3.95E+00	2.52E+00
HWD	kg	1.61E-06	2.59E-07	8.44E-06	7.38E-06	0.00E+00
NHWD	kg	3.49E-02	3.29E-02	1.15E-01	1.04E-01	3.87E-02
RWD	kg	2.73E-04	3.87E-05	1.47E-03	1.29E-03	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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



Goulburn/ Central Murray Region

Environmental profiles and parameters.

Product table list
Goulburn/Central Murray Region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower Carbon Concrete Products

Table No. 1 and 2
- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa
- ENVISIA® 65 MPa

Table No. 3 and 4
- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 6
- ENVIROCRETE® 40% 20 MPa
- ENVIROCRETE® 40% 25 MPa
- ENVIROCRETE® 40% 32 MPa
- ENVIROCRETE® 40% 40 MPa
- ENVIROCRETE® 40 % 50 MPa

Table No. 7 and 8
- ENVIROCRETE® 30% 20 MPa
- ENVIROCRETE® 30% 25 MPa
- ENVIROCRETE® 30% 32 MPa
- ENVIROCRETE® 30% 40 MPa
- ENVIROCRETE® 30% 50 MPa

Table No. 9 and 10
- ENVIROCRETE 20 MPa
- ENVIROCRETE 25 MPa
- ENVIROCRETE 32 MPa
- ENVIROCRETE 40 MPa
- ENVIROCRETE 50 MPa

Normal Class Concrete Products

Table No. 11 and 12
- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 13 and 14
- NORMAL CLASS GP/FA BLEND 20 MPa
- NORMAL CLASS GP/FA BLEND 25 MPa
- NORMAL CLASS GP/FA BLEND 32 MPa
- NORMAL CLASS GP/FA BLEND 40 MPa
- NORMAL CLASS GP/FA BLEND 50 MPa

Table No. 15 and 16
- NORMAL CLASS GP/GGBFS BLEND 20 MPa
- NORMAL CLASS GP/GGBFS BLEND 25 MPa
- NORMAL CLASS GP/GGBFS BLEND 32 MPa
- NORMAL CLASS GP/GGBFS BLEND 40 MPa
- NORMAL CLASS GP/GGBFS BLEND 50 MPa

Vic Roads Concrete Products

Table No. 17 and 18
- VR330 32 MPa GP
- VR330 32 MPa GP/SLAG
- VR400 40 MPa GP
- VR400 40 MPa GP/SLAG
- VR400 40 MPa TREMIE GP/SLAG
- VR400 40 MPa TREMIE/CFA GP/SLAG

Table No. 19 and 20
- VR450 50 MPa GP
- VR450 50 MPa TREMIE GP/SLAG
- VR450 50 MPa GP/SLAG
- VR450 50 MPa TREMIE/CFA GP/SLAG

Concrete Products for Special Applications

Table No. 21 and 22
- HIGH SLUMP 20 MPa
- HIGH SLUMP 25 MPa
- HIGH SLUMP 32 MPa
- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 23 and 24
- TREMIE 40 MPa
- TREMIE 50 MPa
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa
- SHOTCRETE 40 MPa

Table No. 25 and 26
- STABILISED SAND 3%
- STABILISED SAND 5%
- KERB MACHINE 320KG/M^3
- KERB MACHINE 280KG/M^3
- NO FINES 4%

Goulburn/Central Murray Region

GWP SUMMARY (kg CO_2 eq/m^3)

ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
168	183	209	288	326	386
ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa	
193	216	234	274	342	
ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa	
230	253	285	340	420	
ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa	
255	281	318	381	471	
ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa	
215	237	269	304	372	
Normal GP blend 20 MPa	Normal GP blend 25 MPa	Normal GP blend 32 MPa	Normal GP blend 40 MPa	Normal GP blend 50 MPa	
273	304	358	395	500	
Normal GP/FA blend 20 MPa	Normal GP/FA blend 25 MPa	Normal GP/FA blend 32 MPa	Normal GP/FA blend 40 MPa	Normal GP/FA blend 50 MPa	
244	279	309	341	463	
Normal GP/ GGBFS blend 20 MPa	Normal GP/ GGBFS blend 25 MPa	Normal GP/ GGBFS blend 32 MPa	Normal GP/ GGBFS blend 40 MPa	Normal GP/ GGBFS blend 50 MPa	
243	271	317	350	442	
VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/ SLAG	VR400 40 MPa TREMIE/CFA GP/SLAG
399	243	460	314	283	327
VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/ SLAG	VR450 50 MPa TREMIE/CFA GP/SLAG		
311	512	313	340		
HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
257	276	373	427	515	486	511
TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa	
321	402	410	389	422	461	
KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%	STABILISED SAND 3%	STABILISED SAND 5%		
313	278	82	78	109		

Goulburn/Central Murray Region

Table 1. Environmental profiles (A1-A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
GWP	**kg CO_2 eq**	**168**	**183**	**209**	**288**	**326**	**386**
ODP	kg CFC11 eq	6.01E-06	6.43E-06	6.93E-06	8.40E-06	9.14E-06	1.07E-05
AP	kg SO_2 eq	0.844	0.931	1.04	1.35	1.52	1.83
EP	kg PO_4^{3-} eq	0.113	0.123	0.137	0.181	0.202	0.239
POCP	kg C_2H_4 eq	0.0594	0.0640	0.0698	0.0869	0.0956	0.112
ADPE	kg Sb eq	2.14E-06	2.36E-06	2.70E-06	3.09E-06	3.69E-06	3.90E-06
ADPF	MJ_{NCV}	1540	1670	1870	2440	2730	3220

Table 2. Environmental parameters (A1-A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
PERE	MJ_{NCV}	1.88E+01	2.04E+01	2.32E+01	2.84E+01	3.15E+01	3.58E+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}	1.88E+01	2.04E+01	2.32E+01	2.84E+01	3.15E+01	3.58E+01
PENRE	MJ_{NCV}	1.59E+03	1.73E+03	1.93E+03	2.50E+03	2.80E+03	3.30E+03
PENRM	MJ_{NCV}	5.03E+00	5.68E+00	6.78E+00	7.54E+00	9.73E+00	9.73E+00
PENRT	MJ_{NCV}	1.60E+03	1.74E+03	1.94E+03	2.51E+03	2.81E+03	3.31E+03
SM	kg	1.46E+02	1.66E+02	1.77E+02	2.08E+02	2.39E+02	3.07E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.89E+00	3.93E+00	4.06E+00	4.36E+00	4.45E+00	4.68E+00
HWD	kg	5.44E-06	6.15E-06	7.32E-06	8.09E-06	1.04E-05	1.04E-05
NHWD	kg	9.98E-02	1.08E-01	1.25E-01	1.41E-01	1.58E-01	1.68E-01
RWD	kg	9.46E-04	1.07E-03	1.27E-03	1.41E-03	1.82E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Goulburn/Central Murray Region

Table 3. Environmental profiles (A1–A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
GWP	**kg CO_2 eq**	**193**	**216**	**234**	**274**	**342**
ODP	kg CFC11 eq	5.99E-06	6.49E-06	6.84E-06	7.70E-06	9.09E-06
AP	kg SO_2 eq	0.855	0.959	1.04	1.22	1.51
EP	kg PO_4^{3-} eq	0.122	0.135	0.145	0.169	0.208
POCP	kg C_2H_4 eq	0.0600	0.0656	0.0697	0.0795	0.0956
ADPE	kg Sb eq	2.12E-06	2.34E-06	2.64E-06	2.94E-06	3.65E-06
ADPF	MJ_{NCV}	1630	1820	1950	2260	2780

Table 4. Environmental parameters (A1–A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
PERE	MJ_{NCV}	1.87E+01	2.06E+01	2.22E+01	2.53E+01	3.08E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.87E+01	2.06E+01	2.22E+01	2.53E+01	3.08E+01
PENRE	MJ_{NCV}	1.67E+03	1.86E+03	1.99E+03	2.31E+03	2.84E+03
PENRM	MJ_{NCV}	5.03E+00	5.68E+00	6.78E+00	7.54E+00	9.73E+00
PENRT	MJ_{NCV}	1.68E+03	1.86E+03	2.00E+03	2.32E+03	2.85E+03
SM	kg	1.12E+02	1.29E+02	1.40E+02	1.68E+02	2.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.93E+00	4.00E+00	4.08E+00	4.22E+00	4.48E+00
HWD	kg	5.44E-06	6.15E-06	7.32E-06	8.09E-06	1.04E-05
NHWD	kg	9.35E-02	1.02E-01	1.11E-01	1.23E-01	1.49E-01
RWD	kg	9.46E-04	1.07E-03	1.27E-03	1.41E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Goulburn/Central Murray Region

Table 5. Environmental profiles (A1–A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
GWP	**kg CO_2 eq**	**230**	**253**	**285**	**340**	**420**
ODP	kg CFC11 eq	6.02E-06	6.50E-06	6.89E-06	7.77E-06	9.17E-06
AP	kg SO_2 eq	0.882	0.98	1.07	1.27	1.57
EP	kg PO_4^{3-} eq	0.135	0.149	0.164	0.193	0.237
POCP	kg C_2H_4 eq	0.0615	0.0671	0.0719	0.0825	0.0990
ADPE	kg Sb eq	2.11E-06	2.33E-06	2.64E-06	2.94E-06	3.65E-06
ADPF	MJ_{NCV}	1790	1970	2170	2550	3120

Table 6. Environmental parameters (A1–A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
PERE	MJ_{NCV}	1.93E+01	2.11E+01	2.31E+01	2.66E+01	3.23E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.93E+01	2.11E+01	2.31E+01	2.66E+01	3.23E+01
PENRE	MJ_{NCV}	1.81E+03	1.99E+03	2.19E+03	2.56E+03	3.13E+03
PENRM	MJ_{NCV}	5.03E+00	5.68E+00	6.78E+00	7.54E+00	9.73E+00
PENRT	MJ_{NCV}	1.82E+03	2.00E+03	2.19E+03	2.57E+03	3.14E+03
SM	kg	6.45E+01	8.11E+01	7.49E+01	8.42E+01	1.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.02E+00	4.09E+00	4.21E+00	4.38E+00	4.68E+00
HWD	kg	5.44E-06	6.15E-06	7.32E-06	8.09E-06	1.04E-05
NHWD	kg	9.02E-02	9.73E-02	1.07E-01	1.19E-01	1.43E-01
RWD	kg	9.46E-04	1.07E-03	1.27E-03	1.41E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 7. Environmental profiles (A1-A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
GWP	**kg CO_2 eq**	**255**	**281**	**318**	**381**	**471**
ODP	kg CFC11 eq	6.10E-06	6.58E-06	6.98E-06	7.88E-06	9.31E-06
AP	kg SO_2 eq	0.912	1.02	1.11	1.31	1.63
EP	kg PO_4^{3-} eq	0.145	0.160	0.177	0.209	0.256
POCP	kg C_2H_4 eq	0.0632	0.0688	0.0741	0.0850	0.102
ADPE	kg Sb eq	2.14E-06	2.36E-06	2.68E-06	2.98E-06	3.70E-06
ADPF	MJ_{NCV}	1920	2110	2330	2740	3360

Table 8. Environmental parameters (A1-A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
PERE	MJ_{NCV}	2.04E+01	2.23E+01	2.46E+01	2.84E+01	3.44E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.04E+01	2.23E+01	2.46E+01	2.84E+01	3.44E+01
PENRE	MJ_{NCV}	1.92E+03	2.11E+03	2.33E+03	2.73E+03	3.35E+03
PENRM	MJ_{NCV}	5.03E+00	5.68E+00	6.78E+00	7.54E+00	9.73E+00
PENRT	MJ_{NCV}	1.93E+03	2.12E+03	2.34E+03	2.74E+03	3.36E+03
SM	kg	3.33E+01	4.68E+01	3.43E+01	3.54E+01	5.41E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.10E+00	4.18E+00	4.31E+00	4.51E+00	4.83E+00
HWD	kg	5.44E-06	6.15E-06	7.32E-06	8.09E-06	1.04E-05
NHWD	kg	9.33E-02	1.01E-01	1.11E-01	1.24E-01	1.49E-01
RWD	kg	9.46E-04	1.07E-03	1.27E-03	1.41E-03	1.82E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 9. Environmental profiles (A1–A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
GWP	**kg CO_2 eq**	**215**	**237**	**269**	**304**	**372**
ODP	kg CFC11 eq	6.25E-06	6.68E-06	7.34E-06	7.98E-06	9.31E-06
AP	kg SO_2 eq	0.909	1.003	1.14	1.28	1.56
EP	kg PO_4^{3-} eq	0.132	0.145	0.163	0.183	0.221
POCP	kg C_2H_4 eq	0.0632	0.0681	0.0757	0.0832	0.0986
ADPE	kg Sb eq	2.27E-06	2.50E-06	2.88E-06	3.15E-06	3.91E-06
ADPF	MJ_{NCV}	1760	1930	2170	2430	2940

Table 10. Environmental parameters (A1–A3), lower carbon concrete, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
PERE	MJ_{NCV}	1.92E+01	2.09E+01	2.33E+01	2.58E+01	3.09E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.92E+01	2.09E+01	2.33E+01	2.58E+01	3.09E+01
PENRE	MJ_{NCV}	1.80E+03	1.96E+03	2.21E+03	2.47E+03	2.98E+03
PENRM	MJ_{NCV}	5.66E+00	6.39E+00	7.65E+00	8.49E+00	1.09E+01
PENRT	MJ_{NCV}	1.80E+03	1.97E+03	2.22E+03	2.47E+03	2.99E+03
SM	kg	1.08E+02	1.23E+02	1.41E+02	1.60E+02	2.00E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.03E+00	4.08E+00	4.23E+00	4.35E+00	4.57E+00
HWD	kg	6.12E-06	6.91E-06	8.26E-06	9.10E-06	1.17E-05
NHWD	kg	9.24E-02	9.96E-02	1.11E-01	1.21E-01	1.44E-01
RWD	kg	1.06E-03	1.20E-03	1.44E-03	1.58E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 11. Environmental profiles (A1-A3), normal class concrete, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
GWP	**kg CO_2 eq**	**273**	**304**	**358**	**395**	**500**
ODP	kg CFC11 eq	6.02E-06	6.45E-06	7.24E-06	7.78E-06	9.19E-06
AP	kg SO_2 eq	0.910	1.011	1.18	1.30	1.63
EP	kg PO_4^{3-} eq	0.151	0.167	0.194	0.213	0.266
POCP	kg C_2H_4 eq	0.0631	0.0685	0.0780	0.0845	0.102
ADPE	kg Sb eq	2.29E-06	2.53E-06	2.93E-06	3.19E-06	3.98E-06
ADPF	MJ_{NCV}	1980	2190	2550	2790	3480

Table 12. Environmental parameters (A1-A3), normal class concrete, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
PERE	MJ_{NCV}	2.12E+01	2.33E+01	2.67E+01	2.91E+01	3.58E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.12E+01	2.33E+01	2.67E+01	2.91E+01	3.58E+01
PENRE	MJ_{NCV}	1.98E+03	2.18E+03	2.53E+03	2.77E+03	3.44E+03
PENRM	MJ_{NCV}	5.66E+00	6.39E+00	7.65E+00	8.49E+00	1.09E+01
PENRT	MJ_{NCV}	1.98E+03	2.19E+03	2.54E+03	2.78E+03	3.45E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.19E+00	4.27E+00	4.50E+00	4.67E+00	4.93E+00
HWD	kg	6.12E-06	6.91E-06	8.26E-06	9.10E-06	1.17E-05
NHWD	kg	9.85E-02	1.07E-01	1.21E-01	1.31E-01	1.58E-01
RWD	kg	1.06E-03	1.20E-03	1.44E-03	1.58E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 13. Environmental profiles (A1–A3), normal class concrete, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
GWP	**kg CO_2 eq**	**244**	**279**	**309**	**341**	**463**
ODP	kg CFC11 eq	6.14E-06	6.78E-06	7.53E-06	8.05E-06	9.82E-06
AP	kg SO_2 eq	0.826	0.940	1.04	1.14	1.53
EP	kg PO_4^{3-} eq	0.138	0.157	0.173	0.190	0.251
POCP	kg C_2H_4 eq	0.0625	0.0696	0.0775	0.0836	0.105
ADPE	kg Sb eq	2.38E-06	2.30E-06	2.81E-06	3.06E-06	3.89E-06
ADPF	MJ_{NCV}	1830	2070	2290	2510	3310

Table 14. Environmental parameters (A1–A3), normal class concrete, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
PERE	MJ_{NCV}	1.96E+01	2.13E+01	2.35E+01	2.55E+01	3.33E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.96E+01	2.13E+01	2.35E+01	2.55E+01	3.33E+01
PENRE	MJ_{NCV}	1.83E+03	2.06E+03	2.29E+03	2.50E+03	3.29E+03
PENRM	MJ_{NCV}	6.39E+00	5.68E+00	7.65E+00	8.49E+00	1.09E+01
PENRT	MJ_{NCV}	1.84E+03	2.07E+03	2.29E+03	2.51E+03	3.30E+03
SM	kg	5.20E+01	6.24E+01	8.94E+01	9.88E+01	1.04E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.03E+00	4.13E+00	4.29E+00	4.35E+00	4.76E+00
HWD	kg	6.91E-06	6.15E-06	8.26E-06	9.10E-06	1.17E-05
NHWD	kg	9.78E-02	9.92E-02	1.14E-01	1.22E-01	1.53E-01
RWD	kg	1.20E-03	1.07E-03	1.44E-03	1.58E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 15. Environmental profiles (A1-A3), normal class concrete, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
GWP	**kg CO_2 eq**	**243**	**271**	**317**	**350**	**442**
ODP	kg CFC11 eq	5.94E-06	6.35E-06	7.11E-06	7.65E-06	9.03E-06
AP	kg SO_2 eq	0.875	0.972	1.13	1.25	1.57
EP	kg PO_4^{3-} eq	0.139	0.154	0.178	0.196	0.243
POCP	kg C_2H_4 eq	0.0612	0.0663	0.0753	0.0817	0.0986
ADPE	kg Sb eq	2.25E-06	2.49E-06	2.89E-06	3.15E-06	3.93E-06
ADPF	MJ_{NCV}	1840	2030	2350	2580	3210

Table 16. Environmental parameters (A1-A3), normal class concrete, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
PERE	MJ_{NCV}	1.99E+01	2.18E+01	2.50E+01	2.72E+01	3.34E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.99E+01	2.18E+01	2.50E+01	2.72E+01	3.34E+01
PENRE	MJ_{NCV}	1.85E+03	2.03E+03	2.35E+03	2.58E+03	3.20E+03
PENRM	MJ_{NCV}	5.66E+00	6.39E+00	7.65E+00	8.49E+00	1.09E+01
PENRT	MJ_{NCV}	1.85E+03	2.04E+03	2.36E+03	2.59E+03	3.21E+03
SM	kg	3.64E+01	4.06E+01	4.89E+01	5.41E+01	6.97E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.09E+00	4.16E+00	4.35E+00	4.53E+00	4.75E+00
HWD	kg	6.12E-06	6.91E-06	8.26E-06	9.10E-06	1.17E-05
NHWD	kg	9.46E-02	1.03E-01	1.16E-01	1.25E-01	1.52E-01
RWD	kg	1.06E-03	1.20E-03	1.44E-03	1.58E-03	2.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 17. Environmental profiles (A1-A3), concrete for Vic Roads applications, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**399**	**243**	**460**	**314**	**283**	**327**
ODP	kg CFC11 eq	8.83E-06	7.27E-06	9.53E-06	8.14E-06	8.14E-06	8.85E-06
AP	kg SO_2 eq	1.35	1.14	1.54	1.35	1.32	1.48
EP	kg PO_4^{3-} eq	0.218	0.153	0.248	0.188	0.177	0.201
POCP	kg C_2H_4 eq	0.0944	0.0754	0.104	0.0864	0.0857	0.095
ADPE	kg Sb eq	1.66E-05	1.65E-05	1.68E-05	1.66E-05	2.12E-05	2.01E-05
ADPF	MJ_{NCV}	2890	2070	3280	2510	2410	2790

Table 18. Environmental parameters (A1-A3), concrete for Vic Roads applications, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	3.14E+01	2.49E+01	3.50E+01	2.89E+01	3.17E+01	3.96E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.21E-02	9.62E-02
PERT	MJ_{NCV}	3.14E+01	2.49E+01	3.50E+01	2.89E+01	3.18E+01	3.97E+01
PENRE	MJ_{NCV}	2.88E+03	2.12E+03	3.26E+03	2.56E+03	2.46E+03	2.84E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.35E+00	2.90E+01
PENRT	MJ_{NCV}	2.88E+03	2.12E+03	3.26E+03	2.56E+03	2.47E+03	2.87E+03
SM	kg	0.00E+00	1.77E+02	0.00E+00	1.66E+02	2.08E+02	2.39E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.65E+00	4.18E+00	4.78E+00	4.34E+00	4.32E+00	4.22E+00
HWD	kg	1.44E-05	1.44E-05	1.44E-05	1.44E-05	3.03E-05	5.18E-05
NHWD	kg	4.44E+00	4.42E+00	4.44E+00	4.43E+00	5.21E+00	3.41E+00
RWD	kg	3.38E-03	3.38E-03	3.38E-03	3.38E-03	4.98E-03	7.91E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Goulburn/Central Murray Region

Table 19. Environmental profiles (A1–A3), concrete for Vic Roads applications, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	VR450 50 MPa GP/FA	VR450 50 MPa GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG	VR450 50 MPa TREMIE GP/SLAG
GWP	**kg CO_2 eq**	**512**	**311**	**340**	**313**
ODP	kg CFC11 eq	1.03E-05	8.75E-06	9.13E-06	8.68E-06
AP	kg SO_2 eq	1.71	1.45	1.54	1.45
EP	kg PO_4^{3-} eq	0.275	0.193	0.209	0.193
POCP	kg C_2H_4 eq	0.113	0.0921	0.0983	0.0923
ADPE	kg Sb eq	1.69E-05	1.67E-05	2.07E-05	2.13E-05
ADPF	MJ_{NCV}	3620	2590	2900	2620

Table 20. Environmental parameters (A1–A3), concrete for Vic Roads applications, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	VR450 50 MPa GP/FA	VR450 50 MPa GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG	VR450 50 MPa TREMIE GP/SLAG
PERE	MJ_{NCV}	3.80E+01	2.95E+01	4.13E+01	3.37E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	9.62E-02	7.21E-02
PERT	MJ_{NCV}	3.80E+01	2.95E+01	4.14E+01	3.37E+01
PENRE	MJ_{NCV}	3.60E+03	2.65E+03	2.95E+03	2.69E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	3.17E+01	5.35E+00
PENRT	MJ_{NCV}	3.60E+03	2.65E+03	2.98E+03	2.69E+03
SM	kg	0.00E+00	2.34E+02	2.50E+02	2.34E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.94E+00	4.32E+00	4.27E+00	4.24E+00
HWD	kg	1.44E-05	1.44E-05	5.47E-05	3.03E-05
NHWD	kg	4.45E+00	4.43E+00	3.43E+00	5.21E+00
RWD	kg	3.38E-03	3.38E-03	8.42E-03	4.98E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Goulburn/Central Murray Region

Table 21. Environmental profiles (A1-A3), concrete for special applications, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	**kg CO_2 eq**	**257**	**276**	**373**	**427**	**515**	**486**	**511**
ODP	kg CFC11 eq	6.19E-06	6.49E-06	7.46E-06	8.26E-06	9.37E-06	1.04E-05	1.21E-05
AP	kg SO_2 eq	0.926	0.99	1.23	1.42	1.68	1.89	2.20
EP	kg PO_4^{3-} eq	0.147	0.157	0.202	0.229	0.273	0.273	0.299
POCP	kg C_2H_4 eq	0.0642	0.0678	0.0807	0.0913	0.105	0.116	0.133
ADPE	kg Sb eq	2.39E-06	2.56E-06	3.04E-06	1.59E-05	4.10E-06	3.08E-05	3.18E-05
ADPF	MJ_{NCV}	1940	2070	2650	3010	3580	3680	4040

Table 22. Environmental parameters (A1-A3), concrete for special applications, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ_{NCV}	2.10E+01	2.22E+01	2.77E+01	3.32E+01	3.68E+01	4.67E+01	5.00E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.62E-02	9.62E-02
PERT	MJ_{NCV}	2.10E+01	2.22E+01	2.77E+01	3.32E+01	3.68E+01	4.68E+01	5.01E+01
PENRE	MJ_{NCV}	1.95E+03	2.07E+03	2.63E+03	2.99E+03	3.54E+03	3.69E+03	4.10E+03
PENRM	MJ_{NCV}	6.01E+00	6.56E+00	7.98E+00	0.00E+00	1.13E+01	7.13E+00	7.13E+00
PENRT	MJ_{NCV}	1.95E+03	2.08E+03	2.64E+03	2.99E+03	3.55E+03	3.70E+03	4.10E+03
SM	kg	3.85E+01	4.16E+01	0.00E+00	0.00E+00	0.00E+00	1.61E+02	2.96E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.15E+00	4.22E+00	4.57E+00	4.78E+00	4.94E+00	4.78E+00	4.86E+00
HWD	kg	6.58E-06	7.16E-06	8.69E-06	1.37E-05	1.21E-05	4.28E-05	4.35E-05
NHWD	kg	9.96E-02	1.05E-01	1.26E-01	4.22E+00	1.63E-01	7.67E+00	7.89E+00
RWD	kg	1.14E-03	1.24E-03	1.51E-03	3.21E-03	2.11E-03	7.21E-03	7.38E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	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	0.00E+00

Goulburn/Central Murray Region

Table 23. Environmental profiles (A1–A3), concrete for special applications, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
GWP	**kg CO_2 eq**	**321**	**402**	**410**	**389**	**422**	**461**
ODP	kg CFC11 eq	7.69E-06	9.33E-06	7.91E-06	7.62E-06	9.23E-06	1.02E-05
AP	kg SO_2 eq	1.24	1.58	1.35	1.28	1.48	1.64
EP	kg PO_4^{3-} eq	0.185	0.231	0.220	0.209	0.230	0.252
POCP	kg C_2H_4 eq	0.0807	0.099	0.0865	0.0829	0.102	0.113
ADPE	kg Sb eq	1.20E-06	1.43E-06	3.30E-06	3.14E-06	3.02E-06	3.21E-06
ADPF	MJ_{NCV}	2420	3020	2890	2750	3120	3430

Table 24. Environmental parameters (A1–A3), concrete for special applications, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
PERE	MJ_{NCV}	2.35E+01	2.88E+01	3.00E+01	2.87E+01	7.39E+01	9.09E+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}	2.35E+01	2.88E+01	3.00E+01	2.87E+01	7.39E+01	9.09E+01
PENRE	MJ_{NCV}	2.44E+03	3.05E+03	2.86E+03	2.72E+03	3.07E+03	3.38E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	8.85E+00	8.36E+00	6.01E+00	6.01E+00
PENRT	MJ_{NCV}	2.44E+03	3.05E+03	2.87E+03	2.73E+03	3.08E+03	3.38E+03
SM	kg	1.04E+02	1.46E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.31E+00	4.62E+00	4.64E+00	4.59E+00	2.41E+01	3.08E+01
HWD	kg	0.00E+00	0.00E+00	9.49E-06	8.97E-06	6.97E-06	6.97E-06
NHWD	kg	7.69E-02	8.98E-02	1.34E-01	1.29E-01	1.21E-01	1.26E-01
RWD	kg	0.00E+00	0.00E+00	1.65E-03	1.56E-03	1.20E-03	1.20E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

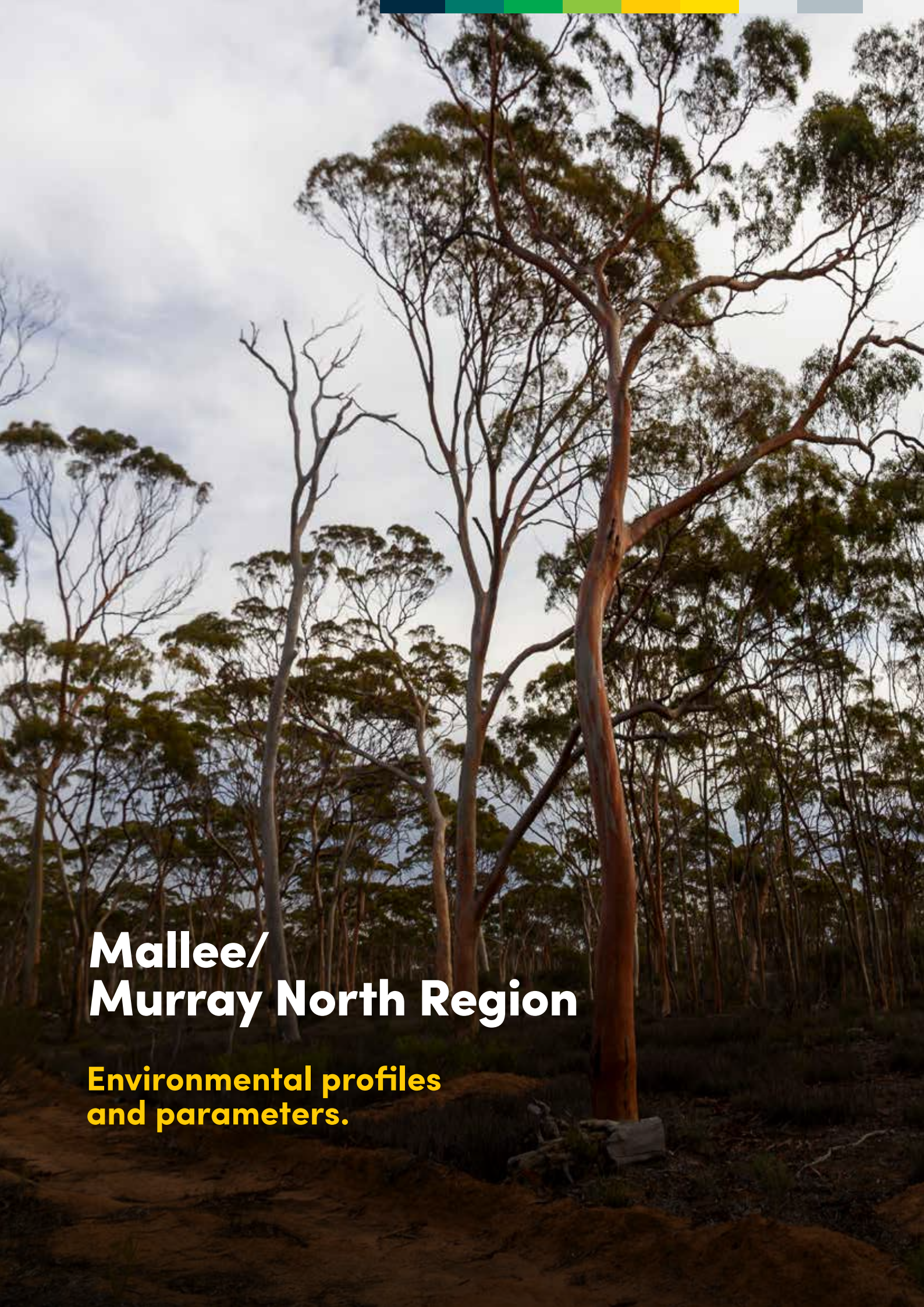
Goulburn/Central Murray Region

Table 25. Environmental profiles (A1-A3), concrete for special applications, Goulburn/Central Murray (VIC), per m^3

Indicator	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
GWP	**kg CO_2 eq**	**78**	**109**	**313**	**278**	**82**
ODP	kg CFC11 eq	3.06E-06	3.54E-06	7.23E-06	6.70E-06	2.39E-06
AP	kg SO_2 eq	0.283	0.385	1.15	1.03	0.287
EP	kg PO_4^{3-} eq	0.0497	0.0659	0.178	0.160	0.0499
POCP	kg C_2H_4 eq	0.0280	0.0337	0.0763	0.0698	0.0227
ADPE	kg Sb eq	2.59E-07	3.33E-07	2.93E-06	2.62E-06	5.81E-07
ADPF	MJ_{NCV}	670	880	2350	2110	650

Table 26. Environmental parameters (A1-A3), concrete for special applications, Goulburn/Central Murray (VIC), per m^3

Parameter	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
PERE	MJ_{NCV}	7.28E+00	9.13E+00	2.49E+01	2.25E+01	8.19E+00
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	7.28E+00	9.13E+00	2.49E+01	2.25E+01	8.19E+00
PENRE	MJ_{NCV}	6.89E+02	8.94E+02	2.36E+03	2.12E+03	6.54E+02
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	7.87E+00	6.88E+00	0.00E+00
PENRT	MJ_{NCV}	6.89E+02	8.94E+02	2.36E+03	2.13E+03	6.54E+02
SM	kg	0.00E+00	0.00E+00	6.66E+01	5.82E+01	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.99E+00	3.12E+00	4.23E+00	4.18E+00	2.61E+00
HWD	kg	0.00E+00	0.00E+00	8.44E-06	7.38E-06	0.00E+00
NHWD	kg	2.76E-02	3.23E-02	1.16E-01	1.06E-01	3.88E-02
RWD	kg	0.00E+00	0.00E+00	1.47E-03	1.29E-03	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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



Mallee/ Murray North Region

Environmental profiles and parameters.

Product table list
Mallee/Murray North Region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower Carbon Concrete Products

Table No. 1 and 2
- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa
- ENVISIA® 65 MPa

Table No. 3 and 4
- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 6
- ENVIROCRETE® 40% 20 MPa
- ENVIROCRETE® 40% 25 MPa
- ENVIROCRETE® 40% 32 MPa
- ENVIROCRETE® 40% 40 MPa
- ENVIROCRETE® 40 % 50 MPa

Table No. 7 and 8
- ENVIROCRETE® 30% 20 MPa
- ENVIROCRETE® 30% 25 MPa
- ENVIROCRETE® 30% 32 MPa
- ENVIROCRETE® 30% 40 MPa
- ENVIROCRETE® 30% 50 MPa

Table No. 9 and 10
- ENVIROCRETE 20 MPa
- ENVIROCRETE 25 MPa
- ENVIROCRETE 32 MPa
- ENVIROCRETE 40 MPa
- ENVIROCRETE 50 MPa

Normal Class Concrete Products

Table No. 11 and 12
- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 13 and 14
- NORMAL CLASS GP/FA BLEND 20 MPa
- NORMAL CLASS GP/FA BLEND 25 MPa
- NORMAL CLASS GP/FA BLEND 32 MPa
- NORMAL CLASS GP/FA BLEND 40 MPa
- NORMAL CLASS GP/FA BLEND 50 MPa

Table No. 15 and 16
- NORMAL CLASS GP/GGBFS BLEND 20 MPa
- NORMAL CLASS GP/GGBFS BLEND 25 MPa
- NORMAL CLASS GP/GGBFS BLEND 32 MPa
- NORMAL CLASS GP/GGBFS BLEND 40 MPa
- NORMAL CLASS GP/GGBFS BLEND 50 MPa

Vic Roads Concrete Products

Table No. 17 and 18
- VR330 32 MPa GP/FA
- VR330 32 MPa GP/SLAG
- VR400 40 MPa GP/FA
- VR400 40 MPa GP/SLAG
- VR400 40 MPa TREMIE GP/SLAG
- VR400 40 MPa TREMIE/CFA GP/SLAG

Table No. 19 and 20
- VR400 40MPA SHOTCRETE
- VR450 50MPA GP/SLAG
- VR450 50MPA GP/FA
- VR450 50MPA TREMIE GP/SLAG
- VR450 50MPA TREMIE/CFA GP/SLAG

Concrete Products for Special Applications

Table No. 21 and 22
- HIGH SLUMP 20 MPa
- HIGH SLUMP 25 MPa
- HIGH SLUMP 32 MPa
- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 23 and 24
- TREMIE 40 MPa
- TREMIE 50 MPa
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa
- SHOTCRETE 40 MPa

Table No. 25 and 26
- STABILISED SAND 3%
- STABILISED SAND 5%
- KERB MACHINE 320KG/M^3
- KERB MACHINE 280KG/M^3
- NO FINES 4%

Mallee/Murray North Region

GWP SUMMARY (kg CO_2 eq/m^3)

ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
217	234	263	348	389	460
ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa	
244	269	289	332	406	
ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa	
249	271	311	338	415	
ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa	
270	294	338	368	455	
ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa	
249	271	311	338	415	
Normal GP blend 20 MPa	Normal GP blend 25 MPa	Normal GP blend 32 MPa	Normal GP blend 40 MPa	Normal GP blend 50 MPa	
331	364	422	461	573	
Normal GP/FA blend 20 MPa	Normal GP/FA blend 25 MPa	Normal GP/FA blend 32 MPa	Normal GP/FA blend 40 MPa	Normal GP/FA blend 50 MPa	
309	338	391	425	528	
Normal GP/ GGBFS blend 20 MPa	Normal GP/ GGBFS blend 25 MPa	Normal GP/ GGBFS blend 32 MPa	Normal GP/ GGBFS blend 40 MPa	Normal GP/ GGBFS blend 50 MPa	
300	329	381	415	514	
VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/ SLAG	VR400 40 MPa TREMIE/CFA GP/SLAG
366	299	419	339	340	378
VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/ SLAG	VR450 50 MPa TREMIE/CFA GP/SLAG	
463	375	476	375	391	
HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
315	345	393	437	533	548	586
TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa	
396	482	472	455	485	507	
KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%	STABILISED SAND 3%	STABILISED SAND 5%		
378	340	150	73.7	107		

Mallee/Murray North Region

Table 1. Environmental profiles (A1-A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Indicator	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
GWP	**kg CO_2 eq**	**217**	**234**	**263**	**348**	**389**	**460**
ODP	kg CFC11 eq	1.22E-05	1.28E-05	1.38E-05	1.58E-05	1.71E-05	1.92E-05
AP	kg SO_2 eq	1.083	1.175	1.31	1.63	1.82	2.16
EP	kg PO_4^{3-} eq	0.158	0.169	0.187	0.235	0.260	0.304
POCP	kg C_2H_4 eq	0.1107	0.1166	0.1263	0.1482	0.1609	0.183
ADPE	kg Sb eq	2.09E-06	2.34E-06	2.59E-06	3.10E-06	3.73E-06	1.43E-05
ADPF	MJ_{NCV}	2200	2350	2610	3240	3580	4240

Table 2. Environmental parameters (A1-A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Parameter	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
PERE	MJ_{NCV}	1.94E+01	2.10E+01	2.39E+01	2.92E+01	3.25E+01	4.67E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-01
PERT	MJ_{NCV}	1.94E+01	2.10E+01	2.39E+01	2.92E+01	3.25E+01	4.69E+01
PENRE	MJ_{NCV}	2.31E+03	2.47E+03	2.73E+03	3.37E+03	3.72E+03	4.39E+03
PENRM	MJ_{NCV}	4.81E+00	5.57E+00	6.12E+00	7.43E+00	9.62E+00	2.34E+01
PENRT	MJ_{NCV}	2.32E+03	2.48E+03	2.74E+03	3.38E+03	3.73E+03	4.42E+03
SM	kg	1.46E+02	1.66E+02	1.83E+02	2.08E+02	2.39E+02	3.07E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.86E+00	3.89E+00	4.01E+00	4.28E+00	4.37E+00	4.64E+00
HWD	kg	5.16E-06	6.02E-06	6.60E-06	7.97E-06	1.03E-05	4.67E-05
NHWD	kg	1.03E-01	1.12E-01	1.27E-01	1.47E-01	1.65E-01	1.86E+00
RWD	kg	8.98E-04	1.05E-03	1.15E-03	1.39E-03	1.80E-03	5.66E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Mallee/Murray North Region

Table 3. Environmental profiles (A1–A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Indicator	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
GWP	**kg CO_2 eq**	**244**	**269**	**289**	**332**	**406**
ODP	kg CFC11 eq	1.24E-05	1.30E-05	1.36E-05	1.48E-05	1.71E-05
AP	kg SO_2 eq	1.104	1.210	1.30	1.49	1.82
EP	kg PO_4^{3-} eq	0.169	0.183	0.196	0.221	0.266
POCP	kg C_2H_4 eq	0.1137	0.1196	0.1259	0.1388	0.1613
ADPE	kg Sb eq	2.09E-06	2.74E-06	3.49E-06	3.50E-06	3.73E-06
ADPF	MJ_{NCV}	2320	2520	2690	3040	3640

Table 4. Environmental parameters (A1–A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Parameter	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
PERE	MJ_{NCV}	1.94E+01	2.18E+01	2.41E+01	2.68E+01	3.18E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.94E+01	2.18E+01	2.41E+01	2.68E+01	3.18E+01
PENRE	MJ_{NCV}	2.42E+03	2.62E+03	2.80E+03	3.15E+03	3.76E+03
PENRM	MJ_{NCV}	4.81E+00	7.38E+00	1.04E+01	9.84E+00	9.84E+00
PENRT	MJ_{NCV}	2.43E+03	2.63E+03	2.81E+03	3.16E+03	3.77E+03
SM	kg	1.12E+02	1.29E+02	1.40E+02	1.68E+02	2.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.98E+00	4.01E+00	4.09E+00	4.17E+00	4.37E+00
HWD	kg	5.24E-06	7.95E-06	1.12E-05	1.05E-05	1.05E-05
NHWD	kg	9.77E-02	1.16E-01	1.36E-01	1.41E-01	1.56E-01
RWD	kg	9.09E-04	1.38E-03	1.94E-03	1.84E-03	1.84E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Mallee/Murray North Region

Table 5. Environmental profiles (A1-A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Indicator	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
GWP	**kg CO_2 eq**	**249**	**271**	**311**	**338**	**415**
ODP	kg CFC11 eq	1.23E-05	1.29E-05	1.41E-05	1.48E-05	1.69E-05
AP	kg SO_2 eq	1.083	1.18	1.35	1.46	1.78
EP	kg PO_4^{3-} eq	0.170	0.183	0.207	0.222	0.268
POCP	kg C_2H_4 eq	0.1125	0.1186	0.1309	0.1381	0.1601
ADPE	kg Sb eq	2.27E-06	2.51E-06	2.88E-06	3.16E-06	4.15E-06
ADPF	MJ_{NCV}	2320	2490	2820	3030	3640

Table 6. Environmental parameters (A1-A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Parameter	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
PERE	MJ_{NCV}	1.88E+01	2.04E+01	2.32E+01	2.51E+01	3.08E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.88E+01	2.04E+01	2.32E+01	2.51E+01	3.08E+01
PENRE	MJ_{NCV}	2.41E+03	2.59E+03	2.92E+03	3.13E+03	3.76E+03
PENRM	MJ_{NCV}	5.79E+00	6.56E+00	7.70E+00	8.63E+00	1.20E+01
PENRT	MJ_{NCV}	2.42E+03	2.60E+03	2.93E+03	3.14E+03	3.77E+03
SM	kg	9.78E+01	1.10E+02	1.31E+02	1.46E+02	1.87E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.96E+00	4.02E+00	4.14E+00	4.23E+00	4.39E+00
HWD	kg	6.25E-06	7.08E-06	8.30E-06	9.26E-06	1.29E-05
NHWD	kg	9.51E-02	1.03E-01	1.15E-01	1.24E-01	1.54E-01
RWD	kg	1.09E-03	1.23E-03	1.44E-03	1.61E-03	2.24E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Mallee/Murray North Region

Table 7. Environmental profiles (A1-A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Indicator	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
GWP	**kg CO_2 eq**	**270**	**294**	**338**	**368**	**455**
ODP	kg CFC11 eq	1.24E-05	1.30E-05	1.42E-05	1.49E-05	1.71E-05
AP	kg SO_2 eq	1.110	1.21	1.38	1.50	1.83
EP	kg PO_4^{3-} eq	0.178	0.192	0.218	0.235	0.284
POCP	kg C_2H_4 eq	0.1145	0.1208	0.1336	0.1411	0.1639
ADPE	kg Sb eq	2.29E-06	2.53E-06	2.91E-06	3.19E-06	4.19E-06
ADPF	MJ_{NCV}	2420	2610	2950	3180	3840

Table 8. Environmental parameters (A1-A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Parameter	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
PERE	MJ_{NCV}	1.97E+01	2.14E+01	2.43E+01	2.64E+01	3.25E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.97E+01	2.14E+01	2.43E+01	2.64E+01	3.25E+01
PENRE	MJ_{NCV}	2.51E+03	2.69E+03	3.04E+03	3.27E+03	3.93E+03
PENRM	MJ_{NCV}	5.79E+00	6.56E+00	7.70E+00	8.63E+00	1.20E+01
PENRT	MJ_{NCV}	2.51E+03	2.70E+03	3.05E+03	3.28E+03	3.95E+03
SM	kg	7.28E+01	8.32E+01	9.88E+01	1.09E+02	1.40E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.02E+00	4.09E+00	4.23E+00	4.32E+00	4.52E+00
HWD	kg	6.25E-06	7.08E-06	8.30E-06	9.26E-06	1.29E-05
NHWD	kg	9.77E-02	1.06E-01	1.19E-01	1.28E-01	1.59E-01
RWD	kg	1.09E-03	1.23E-03	1.44E-03	1.61E-03	2.24E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Mallee/Murray North Region

Table 9. Environmental profiles (A1-A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Indicator	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
GWP	**kg CO_2 eq**	**249**	**271**	**311**	**338**	**415**
ODP	kg CFC11 eq	1.23E-05	1.29E-05	1.41E-05	1.48E-05	1.69E-05
AP	kg SO_2 eq	1.083	1.178	1.35	1.46	1.78
EP	kg PO_4^{3-} eq	0.170	0.183	0.207	0.222	0.268
POCP	kg C_2H_4 eq	0.1125	0.1186	0.1309	0.1381	0.1602
ADPE	kg Sb eq	2.27E-06	2.51E-06	2.88E-06	3.16E-06	3.93E-06
ADPF	MJ_{NCV}	2320	2490	2820	3030	3640

Table 10. Environmental parameters (A1-A3), lower carbon concrete, Mallee/Murray North (VIC), per m^3

Parameter	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
PERE	MJ_{NCV}	1.88E+01	2.04E+01	2.32E+01	2.51E+01	3.05E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.88E+01	2.04E+01	2.32E+01	2.51E+01	3.05E+01
PENRE	MJ_{NCV}	2.41E+03	2.59E+03	2.92E+03	3.13E+03	3.75E+03
PENRM	MJ_{NCV}	5.79E+00	6.56E+00	7.70E+00	8.63E+00	1.10E+01
PENRT	MJ_{NCV}	2.42E+03	2.60E+03	2.93E+03	3.14E+03	3.76E+03
SM	kg	9.78E+01	1.10E+02	1.31E+02	1.46E+02	1.87E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.96E+00	4.02E+00	4.14E+00	4.23E+00	4.43E+00
HWD	kg	6.25E-06	7.08E-06	8.30E-06	9.26E-06	1.18E-05
NHWD	kg	9.51E-02	1.03E-01	1.15E-01	1.24E-01	1.49E-01
RWD	kg	1.09E-03	1.23E-03	1.44E-03	1.61E-03	2.06E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Mallee/Murray North Region

Table 11. Environmental profiles (A1-A3), normal class concrete, Mallee/Murray North (VIC), per m^3

Indicator	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
GWP	**kg CO_2 eq**	**331**	**364**	**422**	**461**	**573**
ODP	kg CFC11 eq	1.27E-05	1.34E-05	1.47E-05	1.54E-05	1.78E-05
AP	kg SO_2 eq	1.188	1.297	1.49	1.61	1.98
EP	kg PO_4^{3-} eq	0.204	0.221	0.252	0.273	0.333
POCP	kg C_2H_4 eq	0.1205	0.1276	0.1416	0.1500	0.1755
ADPE	kg Sb eq	2.35E-06	2.60E-06	2.99E-06	3.28E-06	4.09E-06
ADPF	MJ_{NCV}	2730	2960	3370	3640	4430

Table 12. Environmental parameters (A1-A3), normal class concrete, Mallee/Murray North (VIC), per m^3

Parameter	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
PERE	MJ_{NCV}	2.23E+01	2.44E+01	2.79E+01	3.03E+01	3.73E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.23E+01	2.44E+01	2.79E+01	3.03E+01	3.73E+01
PENRE	MJ_{NCV}	2.78E+03	3.01E+03	3.42E+03	3.69E+03	4.47E+03
PENRM	MJ_{NCV}	5.79E+00	6.56E+00	7.70E+00	8.63E+00	1.10E+01
PENRT	MJ_{NCV}	2.79E+03	3.02E+03	3.43E+03	3.69E+03	4.48E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.21E+00	4.30E+00	4.49E+00	4.61E+00	4.92E+00
HWD	kg	6.26E-06	7.08E-06	8.30E-06	9.26E-06	1.18E-05
NHWD	kg	1.05E-01	1.14E-01	1.29E-01	1.39E-01	1.68E-01
RWD	kg	1.09E-03	1.23E-03	1.44E-03	1.61E-03	2.06E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Mallee/Murray North Region

Table 13. Environmental profiles (A1–A3), normal class concrete, Mallee/Murray North (VIC), per m^3

Indicator	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
GWP	**kg CO_2 eq**	**309**	**338**	**391**	**425**	**528**
ODP	kg CFC11 eq	1.30E-05	1.39E-05	1.51E-05	1.59E-05	1.83E-05
AP	kg SO_2 eq	1.125	1.227	1.40	1.51	1.86
EP	kg PO_4^{3-} eq	0.195	0.212	0.240	0.259	0.314
POCP	kg C_2H_4 eq	0.1217	0.1304	0.1430	0.1519	0.177
ADPE	kg Sb eq	2.43E-06	2.66E-06	3.10E-06	3.38E-06	4.19E-06
ADPF	MJ_{NCV}	2620	2850	3220	3470	4210

Table 14. Environmental parameters (A1–A3), normal class concrete, Mallee/Murray North (VIC), per m^3

Parameter	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
PERE	MJ_{NCV}	2.09E+01	2.27E+01	2.60E+01	2.81E+01	3.44E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.09E+01	2.27E+01	2.60E+01	2.81E+01	3.44E+01
PENRE	MJ_{NCV}	2.69E+03	2.91E+03	3.28E+03	3.53E+03	4.26E+03
PENRM	MJ_{NCV}	6.39E+00	7.10E+00	8.52E+00	9.45E+00	1.20E+01
PENRT	MJ_{NCV}	2.69E+03	2.92E+03	3.29E+03	3.54E+03	4.28E+03
SM	kg	5.41E+01	6.03E+01	7.18E+01	8.01E+01	1.03E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.08E+00	4.18E+00	4.31E+00	4.43E+00	4.68E+00
HWD	kg	6.90E-06	7.67E-06	9.18E-06	1.01E-05	1.29E-05
NHWD	kg	1.05E-01	1.13E-01	1.28E-01	1.38E-01	1.66E-01
RWD	kg	1.20E-03	1.33E-03	1.60E-03	1.77E-03	2.24E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Mallee/Murray North Region

Table 15. Environmental profiles (A1-A3), normal class concrete, Mallee/Murray North (VIC), per m^3

Indicator	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
GWP	**kg CO_2 eq**	**300**	**329**	**381**	**415**	**514**
ODP	kg CFC11 eq	1.26E-05	1.32E-05	1.45E-05	1.52E-05	1.74E-05
AP	kg SO_2 eq	1.149	1.252	1.44	1.56	1.91
EP	kg PO_4^{3-} eq	0.191	0.207	0.235	0.254	0.308
POCP	kg C_2H_4 eq	0.1175	0.1242	0.1376	0.1456	0.1697
ADPE	kg Sb eq	2.32E-06	2.56E-06	2.95E-06	3.24E-06	4.03E-06
ADPF	MJ_{NCV}	2580	2780	3160	3410	4130

Table 16. Environmental parameters (A1-A3), normal class concrete, Mallee/Murray North (VIC), per m^3

Parameter	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
PERE	MJ_{NCV}	2.10E+01	2.29E+01	2.62E+01	2.84E+01	3.47E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.10E+01	2.29E+01	2.62E+01	2.84E+01	3.47E+01
PENRE	MJ_{NCV}	2.64E+03	2.85E+03	3.23E+03	3.48E+03	4.20E+03
PENRM	MJ_{NCV}	5.79E+00	6.56E+00	7.70E+00	8.63E+00	1.10E+01
PENRT	MJ_{NCV}	2.65E+03	2.86E+03	3.24E+03	3.49E+03	4.21E+03
SM	kg	3.64E+01	4.16E+01	4.89E+01	5.41E+01	7.07E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.12E+00	4.20E+00	4.36E+00	4.47E+00	4.74E+00
HWD	kg	6.25E-06	7.08E-06	8.30E-06	9.26E-06	1.18E-05
NHWD	kg	1.01E-01	1.10E-01	1.24E-01	1.33E-01	1.61E-01
RWD	kg	1.09E-03	1.23E-03	1.44E-03	1.61E-03	2.06E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Mallee/Murray North Region

Table 17. Environmental profiles (A1-A3), concrete for Vic Roads applications, Mallee/Murray North (VIC), per m^3

Indicator	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**366**	**299**	**419**	**339**	**340**	**378**
ODP	kg CFC11 eq	1.47E-05	1.43E-05	1.60E-05	1.55E-05	1.53E-05	1.52E-05
AP	kg SO_2 eq	1.34	1.40	1.52	1.59	1.59	1.73
EP	kg PO_4^{3-} eq	0.227	0.204	0.255	0.228	0.228	0.247
POCP	kg C_2H_4 eq	0.1398	0.1330	0.153	0.1454	0.1444	0.147
ADPE	kg Sb eq	1.33E-05	1.33E-05	1.66E-05	1.66E-05	2.12E-05	2.01E-05
ADPF	MJ_{NCV}	3070	2800	3450	3140	3170	3470

Table 18. Environmental parameters (A1-A3), concrete for Vic Roads applications, Mallee/Murray North (VIC), per m^3

Parameter	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	2.60E+01	2.47E+01	2.98E+01	2.83E+01	3.26E+01	4.04E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.21E-02	9.62E-02
PERT	MJ_{NCV}	2.60E+01	2.47E+01	2.98E+01	2.83E+01	3.26E+01	4.05E+01
PENRE	MJ_{NCV}	3.13E+03	2.93E+03	3.52E+03	3.27E+03	3.29E+03	3.58E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.35E+00	2.90E+01
PENRT	MJ_{NCV}	3.13E+03	2.93E+03	3.52E+03	3.27E+03	3.30E+03	3.61E+03
SM	kg	8.84E+01	1.77E+02	1.04E+02	2.08E+02	2.08E+02	2.39E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.21E+00	4.08E+00	4.35E+00	4.19E+00	4.20E+00	4.12E+00
HWD	kg	1.14E-05	1.14E-05	1.44E-05	1.44E-05	3.03E-05	5.18E-05
NHWD	kg	3.52E+00	3.52E+00	4.44E+00	4.43E+00	5.21E+00	3.42E+00
RWD	kg	2.68E-03	2.68E-03	3.38E-03	3.38E-03	4.98E-03	7.91E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Mallee/Murray North Region

Table 19. Environmental profiles (A1-A3), concrete for Vic Roads applications, Mallee/Murray North (VIC), per m^3

Indicator	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**463**	**375**	**476**	**375**	**391**
ODP	kg CFC11 eq	1.60E-05	1.67E-05	1.73E-05	1.64E-05	1.55E-05
AP	kg SO_2 eq	1.77	1.76	1.71	1.75	1.78
EP	kg PO_4^{3-} eq	0.276	0.251	0.287	0.250	0.255
POCP	kg C_2H_4 eq	0.162	0.158	0.168	0.156	0.150
ADPE	kg Sb eq	2.11E-05	1.87E-05	1.86E-05	2.33E-05	2.08E-05
ADPF	MJ_{NCV}	3840	3450	3860	3460	3580

Table 20. Environmental parameters (A1-A3), concrete for Vic Roads applications, Mallee/Murray North (VIC), per m^3

Parameter	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	9.29E+01	3.12E+01	3.36E+01	3.53E+01	4.20E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	7.21E-02	9.62E-02
PERT	MJ_{NCV}	9.29E+01	3.12E+01	3.36E+01	3.54E+01	4.21E+01
PENRE	MJ_{NCV}	3.85E+03	3.59E+03	3.93E+03	3.60E+03	3.69E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	5.35E+00	3.17E+01
PENRT	MJ_{NCV}	3.85E+03	3.59E+03	3.93E+03	3.60E+03	3.72E+03
SM	kg	7.28E+01	2.34E+02	1.04E+02	2.34E+02	2.50E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.05E+01	4.32E+00	4.54E+00	4.26E+00	4.15E+00
HWD	kg	1.83E-05	1.62E-05	1.62E-05	3.21E-05	5.47E-05
NHWD	kg	5.60E+00	4.98E+00	4.99E+00	5.76E+00	3.43E+00
RWD	kg	4.28E-03	3.80E-03	3.80E-03	5.41E-03	8.42E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Mallee/Murray North Region

Table 21. Environmental profiles (A1-A3), concrete for special applications, Mallee/Murray North (VIC), per m^3

Indicator	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	**kg CO_2 eq**	**315**	**345**	**393**	**437**	**533**	**548**	**586**
ODP	kg CFC11 eq	1.30E-05	1.36E-05	1.46E-05	1.54E-05	1.76E-05	1.87E-05	2.10E-05
AP	kg SO_2 eq	1.204	1.31	1.48	1.63	1.99	2.17	2.52
EP	kg PO_4^{3-} eq	0.200	0.215	0.242	0.264	0.318	0.333	0.367
POCP	kg C_2H_4 eq	0.122	0.128	0.139	0.148	0.172	0.183	0.205
ADPE	kg Sb eq	2.43E-06	2.68E-06	3.07E-06	3.41E-06	6.41E-06	1.30E-05	1.48E-05
ADPF	MJ_{NCV}	2690	2900	3250	3550	4260	4530	5040

Table 22. Environmental parameters (A1-A3), concrete for special applications, Mallee/Murray North (VIC), per m^3

Parameter	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ_{NCV}	2.20E+01	2.39E+01	2.70E+01	2.98E+01	3.78E+01	4.55E+01	5.15E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-02	1.44E-01	1.35E-01
PERT	MJ_{NCV}	2.20E+01	2.39E+01	2.70E+01	2.98E+01	3.79E+01	4.56E+01	5.17E+01
PENRE	MJ_{NCV}	2.76E+03	2.97E+03	3.31E+03	3.61E+03	4.33E+03	4.62E+03	5.17E+03
PENRM	MJ_{NCV}	6.12E+00	6.88E+00	8.11E+00	9.18E+00	1.14E+01	2.00E+01	2.91E+01
PENRT	MJ_{NCV}	2.76E+03	2.98E+03	3.32E+03	3.62E+03	4.34E+03	4.64E+03	5.20E+03
SM	kg	3.95E+01	4.37E+01	5.20E+01	5.82E+01	8.32E+01	1.61E+02	2.96E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.16E+00	4.24E+00	4.36E+00	4.45E+00	4.75E+00	4.84E+00	5.02E+00
HWD	kg	6.60E-06	7.42E-06	8.74E-06	9.85E-06	1.90E-05	4.17E-05	5.01E-05
NHWD	kg	1.05E-01	1.14E-01	1.27E-01	1.39E-01	6.68E-01	1.72E+00	1.68E+00
RWD	kg	1.15E-03	1.29E-03	1.52E-03	1.71E-03	2.54E-03	4.94E-03	6.56E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	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	0.00E+00

Mallee/Murray North Region

Table 23. Environmental profiles (A1-A3), concrete for special applications, Mallee/Murray North (VIC), per m^3

Indicator	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
GWP	**kg CO_2 eq**	**396**	**482**	**472**	**455**	**485**	**507**
ODP	kg CFC11 eq	1.54E-05	1.76E-05	1.56E-05	1.53E-05	1.55E-05	1.59E-05
AP	kg SO_2 eq	1.59	1.95	1.65	1.60	1.80	1.87
EP	kg PO_4^{3-} eq	0.249	0.298	0.278	0.270	0.284	0.295
POCP	kg C_2H_4 eq	0.147	0.170	0.152	0.149	0.157	0.162
ADPE	kg Sb eq	1.36E-05	1.38E-05	3.33E-06	3.30E-06	3.29E-06	3.34E-06
ADPF	MJ_{NCV}	3380	4040	3710	3600	3890	4050

Table 24. Environmental parameters (A1-A3), concrete for special applications, Mallee/Murray North (VIC), per m^3

Parameter	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
PERE	MJ_{NCV}	3.20E+01	3.74E+01	3.10E+01	3.01E+01	9.03E+01	9.15E+01
PERM	MJ_{NCV}	7.21E-02	7.21E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	3.21E+01	3.75E+01	3.10E+01	3.01E+01	9.03E+01	9.15E+01
PENRE	MJ_{NCV}	3.47E+03	4.13E+03	3.76E+03	3.65E+03	3.90E+03	4.05E+03
PENRM	MJ_{NCV}	5.35E+00	5.35E+00	8.74E+00	8.74E+00	6.56E+00	6.56E+00
PENRT	MJ_{NCV}	3.47E+03	4.14E+03	3.77E+03	3.66E+03	3.90E+03	4.05E+03
SM	kg	1.04E+02	1.46E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.49E+00	4.84E+00	4.63E+00	4.58E+00	3.06E+01	3.07E+01
HWD	kg	2.31E-05	2.31E-05	9.38E-06	9.38E-06	7.81E-06	7.81E-06
NHWD	kg	3.04E+00	3.06E+00	1.41E-01	1.39E-01	1.30E-01	1.33E-01
RWD	kg	3.29E-03	3.29E-03	1.63E-03	1.63E-03	1.34E-03	1.34E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

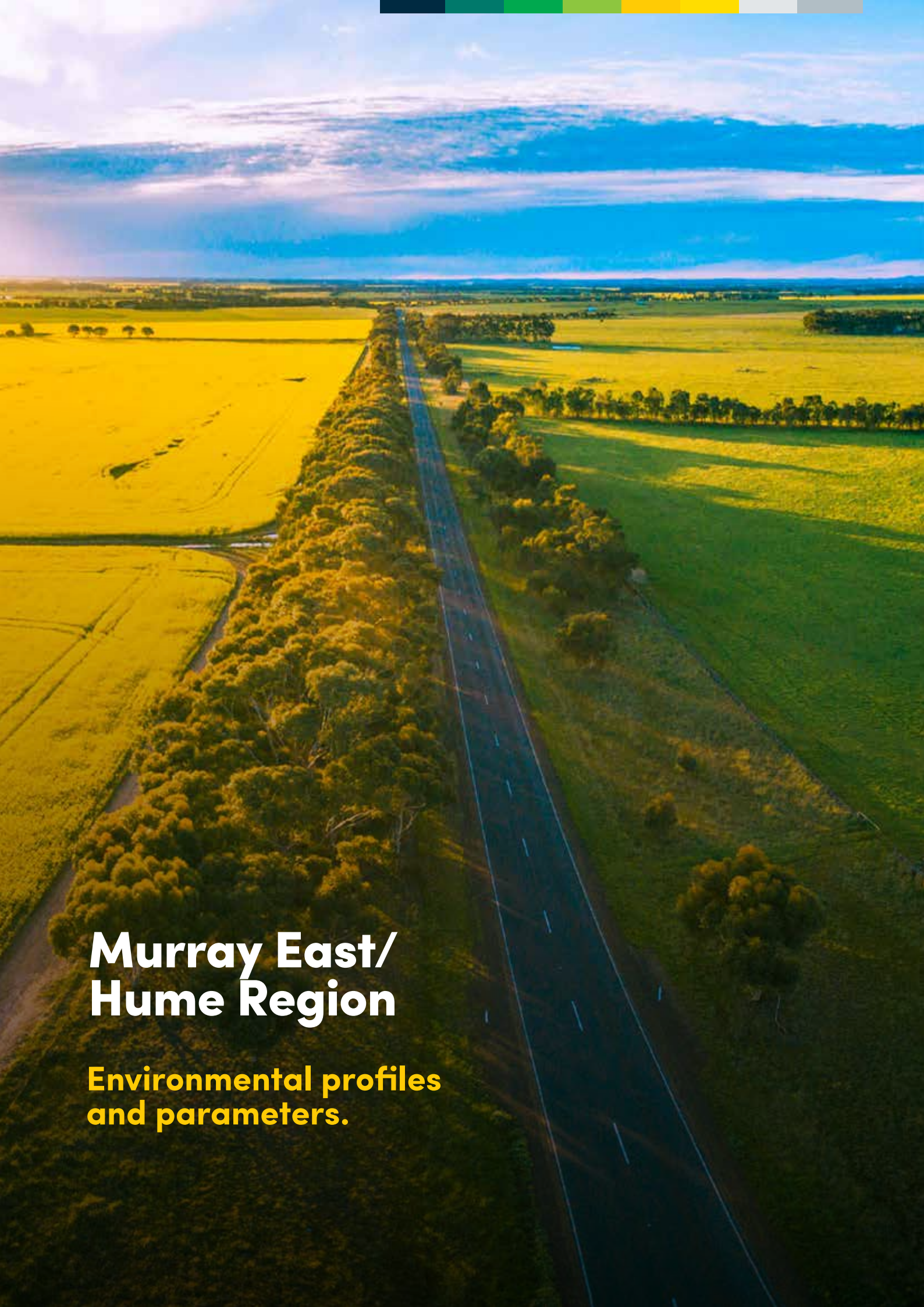
Mallee/Murray North Region

Table 25. Environmental profiles (A1-A3), concrete for special applications, Mallee/Murray North (VIC), per m^3

Indicator	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
GWP	**kg CO_2 eq**	**73.7**	**107**	**378**	**340**	**150**
ODP	kg CFC11 eq	2.45E-06	3.10E-06	1.37E-05	1.30E-05	1.09E-05
AP	kg SO_2 eq	0.264	0.372	1.42	1.28	0.619
EP	kg PO_4^{3-} eq	0.0466	0.0641	0.231	0.211	0.1138
POCP	kg C_2H_4 eq	0.0227	0.0298	0.131	0.123	0.0947
ADPE	kg Sb eq	4.36E-07	5.11E-07	2.95E-06	2.69E-06	6.51E-07
ADPF	MJ_{NCV}	620	840	3100	2840	1550

Table 26. Environmental parameters (A1-A3), concrete for special applications, Mallee/Murray North (VIC), per m^3

Parameter	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
PERE	MJ_{NCV}	7.99E+00	9.86E+00	2.62E+01	2.38E+01	9.31E+00
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	7.99E+00	9.86E+00	2.62E+01	2.38E+01	9.31E+00
PENRE	MJ_{NCV}	6.26E+02	8.51E+02	3.16E+03	2.90E+03	1.64E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	7.87E+00	7.10E+00	0.00E+00
PENRT	MJ_{NCV}	6.26E+02	8.51E+02	3.17E+03	2.91E+03	1.64E+03
SM	kg	0.00E+00	0.00E+00	4.99E+01	4.37E+01	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.03E+00	3.15E+00	4.22E+00	4.23E+00	2.64E+00
HWD	kg	0.00E+00	0.00E+00	8.44E-06	7.62E-06	0.00E+00
NHWD	kg	3.41E-02	3.90E-02	1.22E-01	1.13E-01	4.71E-02
RWD	kg	0.00E+00	0.00E+00	1.47E-03	1.33E-03	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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



Murray East/ Hume Region

Environmental profiles and parameters.

Product table list
Murray East/Hume Region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower Carbon Concrete Products

Table No. 1 and 2
- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa
- ENVISIA® 65 MPa

Table No. 3 and 4
- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 6
- ENVIROCRETE® 40% 20 MPa
- ENVIROCRETE® 40% 25 MPa
- ENVIROCRETE® 40% 32 MPa
- ENVIROCRETE® 40% 40 MPa
- ENVIROCRETE® 40 % 50 MPa

Table No. 7 and 8
- ENVIROCRETE® 30% 20 MPa
- ENVIROCRETE® 30% 25 MPa
- ENVIROCRETE® 30% 32 MPa
- ENVIROCRETE® 30% 40 MPa
- ENVIROCRETE® 30% 50 MPa

Table No. 9 and 10
- ENVIROCRETE 20 MPa
- ENVIROCRETE 25 MPa
- ENVIROCRETE 32 MPa
- ENVIROCRETE 40 MPa
- ENVIROCRETE 50 MPa

Normal Class Concrete Products

Table No. 11 and 12
- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 13 and 14
- NORMAL CLASS GP/FA BLEND 20 MPa
- NORMAL CLASS GP/FA BLEND 25 MPa
- NORMAL CLASS GP/FA BLEND 32 MPa
- NORMAL CLASS GP/FA BLEND 40 MPa
- NORMAL CLASS GP/FA BLEND 50 MPa

Table No. 15 and 16
- NORMAL CLASS GP/GGBFS BLEND 20 MPa
- NORMAL CLASS GP/GGBFS BLEND 25 MPa
- NORMAL CLASS GP/GGBFS BLEND 32 MPa
- NORMAL CLASS GP/GGBFS BLEND 40 MPa
- NORMAL CLASS GP/GGBFS BLEND 50 MPa

Vic Roads Concrete Products

Table No. 17 and 18
- VR330 32 MPa GP/FA
- VR330 32 MPa GP/SLAG
- VR400 40 MPa GP/FA
- VR400 40 MPa GP/SLAG
- VR400 40 MPa TREMIE GP/SLAG
- VR400 40 MPa TREMIE/CFA GP/SLAG

Table No. 19 and 20
- VR400 40 MPa SHOTCRETE
- VR450 50 MPa GP/SLAG
- VR450 50 MPa GP/FA
- VR450 50 MPa TREMIE GP/SLAG
- VR450 50 MPa TREMIE/CFA GP/SLAG

Concrete Products for Special Applications

Table No. 21 and 22
- HIGH SLUMP 20 MPa
- HIGH SLUMP 25 MPa
- HIGH SLUMP 32 MPa
- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 23 and 24
- TREMIE 40 MPa
- TREMIE 50 MPa
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa
- SHOTCRETE 40 MPa

Table No. 25 and 26
- STABILISED SAND 3%
- STABILISED SAND 5%
- KERB MACHINE 320KG/M^3
- KERB MACHINE 280KG/M^3
- NO FINES 4%

Murray East/Hume Region

GWP SUMMARY (kg CO_2 eq/m^3)

ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa	
168	186	212	295	334	396	
ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa		
193	219	237	280	350		
ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa		
230	256	289	347	429		
ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa		
256	285	323	388	480		
ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa		
197	219	263	301	345		
Normal GP blend 20 MPa	Normal GP blend 25 MPa	Normal GP blend 32 MPa	Normal GP blend 40 MPa	Normal GP blend 50 MPa		
277	310	375	430	495		
Normal GP/FA blend 20 MPa	Normal GP/FA blend 25 MPa	Normal GP/FA blend 32 MPa	Normal GP/FA blend 40 MPa	Normal GP/FA blend 50 MPa		
243	273	333	382	450		
Normal GP/ GGBFS blend 20 MPa	Normal GP/ GGBFS blend 25 MPa	Normal GP/ GGBFS blend 32 MPa	Normal GP/ GGBFS blend 40 MPa	Normal GP/ GGBFS blend 50 MPa		
247	276	333	382	439		
VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/ SLAG	VR400 40 MPa TREMIE/CFA GP/SLAG	
338	249	362	288	291	333	
VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/ SLAG	VR450 50 MPa TREMIE/CFA GP/SLAG		
423	322	418	321	347		
HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
288	322	365	451	473	499	529
TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa	
328	412	440	422	427	459	
KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%	STABILISED SAND 3%	STABILISED SAND 5%		
374	331	91	70	103		

Murray East/Hume Region

Table 1. Environmental profiles (A1-A3), lower carbon concrete, Murray East/Hume Region (VIC), per m^3

Indicator	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
GWP	**kg CO_2 eq**	**168**	**186**	**212**	**295**	**334**	**396**
ODP	kg CFC11 eq	6.26E-06	6.79E-06	7.40E-06	9.21E-06	1.02E-05	1.20E-05
AP	kg SO_2 eq	0.847	0.941	1.05	1.38	1.55	1.87
EP	kg PO_4^{3-} eq	0.113	0.124	0.139	0.186	0.209	0.248
POCP	kg C_2H_4 eq	0.0607	0.0666	0.0733	0.0931	0.104	0.123
ADPE	kg Sb eq	1.05E-06	2.42E-06	2.68E-06	3.16E-06	3.78E-06	4.00E-06
ADPF	MJ_{NCV}	1530	1710	1920	2530	2840	3360

Table 2. Environmental parameters (A1-A3), lower carbon concrete, Murray East/Hume Region (VIC), per m^3

Parameter	Unit	ENVISIA 20 MPa	ENVISIA 25 MPa	ENVISIA 32 MPa	ENVISIA 40 MPa	ENVISIA 50 MPa	ENVISIA 65 MPa
PERE	MJ_{NCV}	1.71E+01	2.03E+01	2.30E+01	2.84E+01	3.16E+01	3.60E+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}	1.71E+01	2.03E+01	2.30E+01	2.84E+01	3.16E+01	3.60E+01
PENRE	MJ_{NCV}	1.59E+03	1.77E+03	1.98E+03	2.60E+03	2.92E+03	3.45E+03
PENRM	MJ_{NCV}	5.35E-01	6.23E+00	6.88E+00	7.98E+00	1.02E+01	1.02E+01
PENRT	MJ_{NCV}	1.59E+03	1.78E+03	1.99E+03	2.60E+03	2.93E+03	3.46E+03
SM	kg	1.46E+02	1.66E+02	1.77E+02	2.08E+02	2.39E+02	3.07E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.69E+00	3.74E+00	3.85E+00	4.13E+00	4.22E+00	4.53E+00
HWD	kg	6.39E-07	6.75E-06	7.45E-06	8.56E-06	1.09E-05	1.09E-05
NHWD	kg	7.30E-02	1.09E-01	1.24E-01	1.42E-01	1.60E-01	1.71E-01
RWD	kg	1.10E-04	1.17E-03	1.30E-03	1.49E-03	1.90E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Murray East/Hume Region

Table 3. Environmental profiles (A1–A3), lower carbon concrete, Murray East/Hume (VIC), per m^3

Indicator	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
GWP	**kg CO_2 eq**	**193**	**219**	**237**	**280**	**350**
ODP	kg CFC11 eq	6.28E-06	6.91E-06	7.35E-06	8.45E-06	1.02E-05
AP	kg SO_2 eq	0.859	0.972	1.05	1.24	1.55
EP	kg PO_4^{3-} eq	0.122	0.137	0.148	0.173	0.214
POCP	kg C_2H_4 eq	0.0618	0.0689	0.0737	0.0854	0.104
ADPE	kg Sb eq	1.02E-06	2.41E-06	2.62E-06	3.01E-06	3.74E-06
ADPF	MJ_{NCV}	1630	1860	2000	2340	2890

Table 4. Environmental parameters (A1–A3), lower carbon concrete, Murray East/Hume (VIC), per m^3

Parameter	Unit	ENVIROCRETE PLUS 20 MPa	ENVIROCRETE PLUS 25 MPa	ENVIROCRETE PLUS 32 MPa	ENVIROCRETE PLUS 40 MPa	ENVIROCRETE PLUS 50 MPa
PERE	MJ_{NCV}	1.70E+01	2.05E+01	2.19E+01	2.52E+01	3.08E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.70E+01	2.05E+01	2.19E+01	2.52E+01	3.08E+01
PENRE	MJ_{NCV}	1.68E+03	1.90E+03	2.05E+03	2.39E+03	2.96E+03
PENRM	MJ_{NCV}	5.35E-01	6.23E+00	6.88E+00	7.98E+00	1.02E+01
PENRT	MJ_{NCV}	1.68E+03	1.91E+03	2.06E+03	2.40E+03	2.97E+03
SM	kg	1.12E+02	1.29E+02	1.40E+02	1.68E+02	2.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.74E+00	3.82E+00	3.88E+00	4.01E+00	4.23E+00
HWD	kg	6.39E-07	6.75E-06	7.45E-06	8.56E-06	1.09E-05
NHWD	kg	6.68E-02	1.02E-01	1.10E-01	1.25E-01	1.51E-01
RWD	kg	1.10E-04	1.17E-03	1.30E-03	1.49E-03	1.90E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Murray East/Hume Region

Table 5. Environmental profiles (A1-A3), lower carbon concrete, Murray East/Hume (VIC), per m^3

Indicator	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
GWP	**kg CO_2 eq**	**230**	**256**	**289**	**347**	**429**
ODP	kg CFC11 eq	6.37E-06	6.98E-06	7.48E-06	8.63E-06	1.04E-05
AP	kg SO_2 eq	0.890	1.00	1.09	1.30	1.62
EP	kg PO_4^{3-} eq	0.136	0.152	0.168	0.199	0.244
POCP	kg C_2H_4 eq	0.0640	0.0710	0.0768	0.0896	0.109
ADPE	kg Sb eq	1.02E-06	2.40E-06	2.62E-06	3.02E-06	3.24E-06
ADPF	MJ_{NCV}	1800	2020	2230	2640	3240

Table 6. Environmental parameters (A1-A3), lower carbon concrete, Murray East/Hume (VIC), per m^3

Parameter	Unit	ENVIROCRETE 40% 20 MPa	ENVIROCRETE 40% 25 MPa	ENVIROCRETE 40% 32 MPa	ENVIROCRETE 40% 40 MPa	ENVIROCRETE 40% 50 MPa
PERE	MJ_{NCV}	1.76E+01	2.09E+01	2.29E+01	2.66E+01	3.17E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.76E+01	2.09E+01	2.29E+01	2.66E+01	3.17E+01
PENRE	MJ_{NCV}	1.82E+03	2.04E+03	2.25E+03	2.66E+03	3.26E+03
PENRM	MJ_{NCV}	5.35E-01	6.23E+00	6.88E+00	7.98E+00	7.98E+00
PENRT	MJ_{NCV}	1.82E+03	2.05E+03	2.26E+03	2.66E+03	3.27E+03
SM	kg	6.45E+01	8.11E+01	7.49E+01	8.42E+01	1.15E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.83E+00	3.90E+00	4.00E+00	4.17E+00	4.51E+00
HWD	kg	6.39E-07	6.75E-06	7.45E-06	8.56E-06	8.56E-06
NHWD	kg	6.35E-02	9.78E-02	1.06E-01	1.21E-01	1.34E-01
RWD	kg	1.10E-04	1.17E-03	1.30E-03	1.49E-03	1.49E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Murray East/Hume Region

Table 7. Environmental profiles (A1-A3), lower carbon concrete, Murray East/Hume (VIC), per m^3

Indicator	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
GWP	**kg CO_2 eq**	**256**	**285**	**323**	**388**	**480**
ODP	kg CFC11 eq	6.48E-06	7.11E-06	7.63E-06	8.81E-06	1.06E-05
AP	kg SO_2 eq	0.921	1.03	1.14	1.35	1.68
EP	kg PO_4^{3-} eq	0.147	0.163	0.181	0.215	0.265
POCP	kg C_2H_4 eq	0.0661	0.0733	0.0796	0.0929	0.113
ADPE	kg Sb eq	1.05E-06	2.43E-06	2.65E-06	3.06E-06	3.29E-06
ADPF	MJ_{NCV}	1930	2160	2400	2840	3490

Table 8. Environmental parameters (A1-A3), lower carbon concrete, Murray East/Hume (VIC), per m^3

Parameter	Unit	ENVIROCRETE 30% 20 MPa	ENVIROCRETE 30% 25 MPa	ENVIROCRETE 30% 32 MPa	ENVIROCRETE 30% 40 MPa	ENVIROCRETE 30% 50 MPa
PERE	MJ_{NCV}	1.87E+01	2.22E+01	2.44E+01	2.84E+01	3.39E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.87E+01	2.22E+01	2.44E+01	2.84E+01	3.39E+01
PENRE	MJ_{NCV}	1.94E+03	2.17E+03	2.40E+03	2.84E+03	3.48E+03
PENRM	MJ_{NCV}	5.35E-01	6.23E+00	6.88E+00	7.98E+00	7.98E+00
PENRT	MJ_{NCV}	1.94E+03	2.18E+03	2.41E+03	2.85E+03	3.49E+03
SM	kg	3.33E+01	4.68E+01	3.43E+01	3.54E+01	5.41E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.91E+00	3.99E+00	4.11E+00	4.30E+00	4.67E+00
HWD	kg	6.39E-07	6.75E-06	7.45E-06	8.56E-06	8.56E-06
NHWD	kg	6.67E-02	1.01E-01	1.10E-01	1.26E-01	1.40E-01
RWD	kg	1.10E-04	1.17E-03	1.30E-03	1.49E-03	1.49E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Murray East/Hume Region

Table 9. Environmental profiles (A1–A3), lower carbon concrete, Murray East/Hume (VIC), per m^3

Indicator	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
GWP	**kg CO_2 eq**	**197**	**219**	**263**	**301**	**345**
ODP	kg CFC11 eq	6.28E-06	6.77E-06	7.82E-06	8.68E-06	9.68E-06
AP	kg SO_2 eq	0.835	0.927	1.11	1.27	1.45
EP	kg PO_4^{3-} eq	0.123	0.136	0.161	0.183	0.208
POCP	kg C_2H_4 eq	0.0619	0.0673	0.0786	0.0880	0.0990
ADPE	kg Sb eq	2.01E-06	2.22E-06	2.67E-06	3.01E-06	3.43E-06
ADPF	MJ_{NCV}	1650	1820	2160	2440	2780

Table 10. Environmental parameters (A1–A3), lower carbon concrete, Murray East/Hume (VIC), per m^3

Parameter	Unit	ENVIROCRETE 20 MPa	ENVIROCRETE 25 MPa	ENVIROCRETE 32 MPa	ENVIROCRETE 40 MPa	ENVIROCRETE 50 MPa
PERE	MJ_{NCV}	1.74E+01	1.90E+01	2.23E+01	2.50E+01	2.81E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.74E+01	1.90E+01	2.23E+01	2.50E+01	2.81E+01
PENRE	MJ_{NCV}	1.69E+03	1.86E+03	2.20E+03	2.49E+03	2.83E+03
PENRM	MJ_{NCV}	5.03E+00	5.68E+00	7.02E+00	8.09E+00	9.40E+00
PENRT	MJ_{NCV}	1.69E+03	1.86E+03	2.21E+03	2.50E+03	2.84E+03
SM	kg	9.57E+01	1.08E+02	1.33E+02	1.54E+02	1.79E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.85E+00	3.91E+00	4.09E+00	4.27E+00	4.37E+00
HWD	kg	5.42E-06	6.16E-06	7.60E-06	8.67E-06	1.01E-05
NHWD	kg	8.35E-02	9.06E-02	1.05E-01	1.16E-01	1.30E-01
RWD	kg	9.42E-04	1.07E-03	1.32E-03	1.51E-03	1.75E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Murray East/Hume Region

Table 11. Environmental profiles (A1-A3), normal class concrete, Murray East/Hume (VIC), per m^3

Indicator	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
GWP	**kg CO_2 eq**	**277**	**310**	**375**	**430**	**495**
ODP	kg CFC11 eq	6.64E-06	7.18E-06	8.31E-06	9.25E-06	1.03E-05
AP	kg SO_2 eq	0.932	1.037	1.25	1.43	1.64
EP	kg PO_4^{3-} eq	0.155	0.172	0.206	0.234	0.267
POCP	kg C_2H_4 eq	0.0684	0.0747	0.0877	0.0985	0.111
ADPE	kg Sb eq	2.09E-06	2.32E-06	2.78E-06	3.14E-06	3.58E-06
ADPF	MJ_{NCV}	2040	2260	2710	3080	3520

Table 12. Environmental parameters (A1-A3), normal class concrete, Murray East/Hume (VIC), per m^3

Parameter	Unit	Normal Class GP blend 20 MPa	Normal Class GP blend 25 MPa	Normal Class GP blend 32 MPa	Normal Class GP blend 40 MPa	Normal Class GP blend 50 MPa
PERE	MJ_{NCV}	2.09E+01	2.29E+01	2.71E+01	3.05E+01	3.45E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	2.09E+01	2.29E+01	2.71E+01	3.05E+01	3.45E+01
PENRE	MJ_{NCV}	2.04E+03	2.26E+03	2.70E+03	3.06E+03	3.49E+03
PENRM	MJ_{NCV}	5.03E+00	5.68E+00	7.02E+00	8.09E+00	9.40E+00
PENRT	MJ_{NCV}	2.05E+03	2.26E+03	2.70E+03	3.07E+03	3.50E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.10E+00	4.19E+00	4.44E+00	4.67E+00	4.84E+00
HWD	kg	5.42E-06	6.16E-06	7.60E-06	8.67E-06	1.01E-05
NHWD	kg	9.32E-02	1.02E-01	1.19E-01	1.32E-01	1.48E-01
RWD	kg	9.42E-04	1.07E-03	1.32E-03	1.51E-03	1.75E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Murray East/Hume Region

Table 13. Environmental profiles (A1–A3), normal class concrete, Murray East/Hume (VIC), per m^3

Indicator	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
GWP	**kg CO_2 eq**	**243**	**273**	**333**	**382**	**450**
ODP	kg CFC11 eq	6.48E-06	7.24E-06	8.40E-06	9.38E-06	1.06E-05
AP	kg SO_2 eq	0.829	0.929	1.13	1.29	1.50
EP	kg PO_4^{3-} eq	0.139	0.156	0.187	0.213	0.248
POCP	kg C_2H_4 eq	0.0652	0.0731	0.0860	0.0968	0.110
ADPE	kg Sb eq	2.07E-06	2.41E-06	2.89E-06	3.29E-06	3.85E-06
ADPF	MJ_{NCV}	1840	2060	2480	2820	3280

Table 14. Environmental parameters (A1–A3), normal class concrete, Murray East/Hume (VIC), per m^3

Parameter	Unit	Normal Class GP/FA blend 20 MPa	Normal Class GP/FA blend 25 MPa	Normal Class GP/FA blend 32 MPa	Normal Class GP/FA blend 40 MPa	Normal Class GP/FA blend 50 MPa
PERE	MJ_{NCV}	1.88E+01	2.08E+01	2.47E+01	2.77E+01	3.19E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.88E+01	2.08E+01	2.47E+01	2.77E+01	3.19E+01
PENRE	MJ_{NCV}	1.85E+03	2.07E+03	2.48E+03	2.82E+03	3.27E+03
PENRM	MJ_{NCV}	5.35E+00	6.45E+00	7.98E+00	9.29E+00	1.10E+01
PENRT	MJ_{NCV}	1.85E+03	2.08E+03	2.49E+03	2.83E+03	3.28E+03
SM	kg	5.20E+01	7.80E+01	9.46E+01	1.12E+02	1.30E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.92E+00	4.07E+00	4.29E+00	4.40E+00	4.41E+00
HWD	kg	5.74E-06	6.98E-06	8.62E-06	9.96E-06	1.18E-05
NHWD	kg	8.94E-02	1.01E-01	1.17E-01	1.31E-01	1.50E-01
RWD	kg	1.00E-03	1.21E-03	1.50E-03	1.73E-03	2.06E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 15. Environmental profiles (A1-A3), normal class concrete, Murray East/Hume (VIC), per m^3

Indicator	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
GWP	**kg CO_2 eq**	**247**	**276**	**333**	**382**	**439**
ODP	kg CFC11 eq	6.51E-06	7.03E-06	8.13E-06	9.04E-06	1.01E-05
AP	kg SO_2 eq	0.896	0.996	1.20	1.37	1.57
EP	kg PO_4^{3-} eq	0.143	0.158	0.189	0.215	0.245
POCP	kg C_2H_4 eq	0.0660	0.0719	0.0843	0.0946	0.107
ADPE	kg Sb eq	2.06E-06	2.28E-06	2.74E-06	3.09E-06	3.53E-06
ADPF	MJ_{NCV}	1900	2090	2500	2840	3240

Table 16. Environmental parameters (A1-A3), normal class concrete, Murray East/Hume (VIC), per m^3

Parameter	Unit	Normal Class GP/GGBFS blend 20 MPa	Normal Class GP/GGBFS blend 25 MPa	Normal Class GP/GGBFS blend 32 MPa	Normal Class GP/GGBFS blend 40 MPa	Normal Class GP/GGBFS blend 50 MPa
PERE	MJ_{NCV}	1.96E+01	2.14E+01	2.53E+01	2.84E+01	3.22E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.96E+01	2.14E+01	2.53E+01	2.84E+01	3.22E+01
PENRE	MJ_{NCV}	1.91E+03	2.11E+03	2.51E+03	2.85E+03	3.25E+03
PENRM	MJ_{NCV}	5.03E+00	5.68E+00	7.02E+00	8.09E+00	9.40E+00
PENRT	MJ_{NCV}	1.91E+03	2.11E+03	2.52E+03	2.86E+03	3.26E+03
SM	kg	3.54E+01	4.06E+01	4.99E+01	5.72E+01	6.66E+01
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.01E+00	4.08E+00	4.31E+00	4.52E+00	4.67E+00
HWD	kg	5.42E-06	6.16E-06	7.60E-06	8.67E-06	1.01E-05
NHWD	kg	8.96E-02	9.75E-02	1.14E-01	1.26E-01	1.42E-01
RWD	kg	9.42E-04	1.07E-03	1.32E-03	1.51E-03	1.75E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 17. Environmental profiles (A1-A3), concrete for Vic Roads applications, Murray East/Hume (VIC), per m^3

Indicator	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**338**	**249**	**362**	**288**	**291**	**333**
ODP	kg CFC11 eq	8.31E-06	8.05E-06	8.96E-06	9.02E-06	9.05E-06	1.01E-05
AP	kg SO_2 eq	1.14	1.14	1.24	1.34	1.35	1.52
EP	kg PO_4^{3-} eq	0.189	0.158	0.202	0.181	0.182	0.208
POCP	kg C_2H_4 eq	0.0856	0.0802	0.0934	0.0919	0.0928	0.103
ADPE	kg Sb eq	3.47E-06	3.46E-06	1.65E-05	1.66E-05	2.12E-05	1.40E-05
ADPF	MJ_{NCV}	2500	2130	2690	2450	2500	2860

Table 18. Environmental parameters (A1-A3), concrete for Vic Roads applications, Murray East/Hume (VIC), per m^3

Parameter	Unit	VR330 32 MPa GP/FA	VR330 32 MPa GP/SLAG	VR400 40 MPa GP/FA	VR400 40 MPa GP/SLAG	VR400 40 MPa TREMIE GP/SLAG	VR400 40 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	2.51E+01	2.24E+01	2.89E+01	2.74E+01	3.17E+01	3.43E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.21E-02	0.00E+00
PERT	MJ_{NCV}	2.51E+01	2.24E+01	2.89E+01	2.74E+01	3.18E+01	3.43E+01
PENRE	MJ_{NCV}	2.50E+03	2.19E+03	2.70E+03	2.52E+03	2.57E+03	2.93E+03
PENRM	MJ_{NCV}	7.65E+00	7.65E+00	0.00E+00	0.00E+00	5.35E+00	2.19E+01
PENRT	MJ_{NCV}	2.51E+03	2.20E+03	2.70E+03	2.52E+03	2.57E+03	2.95E+03
SM	kg	7.28E+01	1.77E+02	1.04E+02	2.08E+02	2.08E+02	2.39E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.32E+00	4.10E+00	4.29E+00	4.14E+00	4.21E+00	4.40E+00
HWD	kg	8.81E-06	8.81E-06	1.44E-05	1.44E-05	3.03E-05	3.07E-05
NHWD	kg	2.97E-01	2.88E-01	4.43E+00	4.42E+00	5.21E+00	2.37E+00
RWD	kg	1.57E-03	1.57E-03	3.38E-03	3.38E-03	4.98E-03	5.77E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

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Table 19. Environmental profiles (A1-A3), concrete for Vic Roads applications, Murray East/Hume (VIC), per m^3

Indicator	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
GWP	**kg CO_2 eq**	**423**	**322**	**418**	**321**	**347**
ODP	kg CFC11 eq	1.08E-05	9.84E-06	9.88E-06	9.67E-06	1.00E-05
AP	kg SO_2 eq	1.54	1.50	1.43	1.49	1.57
EP	kg PO_4^{3-} eq	0.237	0.201	0.231	0.200	0.215
POCP	kg C_2H_4 eq	0.116	0.101	0.105	0.100	0.105
ADPE	kg Sb eq	6.15E-06	2.34E-05	2.34E-05	2.32E-05	2.07E-05
ADPF	MJ_{NCV}	3280	2740	3090	2730	2990

Table 20. Environmental parameters (A1-A3), concrete for Vic Roads applications, Murray East/Hume (VIC), per m^3

Parameter	Unit	VR400 40 MPa SHOTCRETE	VR450 50 MPa GP/SLAG	VR450 50 MPa GP/FA	VR450 50 MPa TREMIE GP/SLAG	VR450 50 MPa TREMIE CFA GP/SLAG
PERE	MJ_{NCV}	9.12E+01	3.27E+01	3.50E+01	3.42E+01	4.13E+01
PERM	MJ_{NCV}	2.89E-02	2.40E-02	2.40E-02	7.21E-02	9.62E-02
PERT	MJ_{NCV}	9.12E+01	3.27E+01	3.51E+01	3.43E+01	4.14E+01
PENRE	MJ_{NCV}	3.25E+03	2.81E+03	3.09E+03	2.80E+03	3.05E+03
PENRM	MJ_{NCV}	1.42E+01	1.78E+00	1.78E+00	5.35E+00	3.17E+01
PENRT	MJ_{NCV}	3.26E+03	2.82E+03	3.09E+03	2.81E+03	3.08E+03
SM	kg	7.28E+01	2.34E+02	1.04E+02	2.34E+02	2.50E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.06E+01	4.22E+00	4.42E+00	4.04E+00	4.17E+00
HWD	kg	1.92E-05	2.46E-05	2.46E-05	3.21E-05	5.47E-05
NHWD	kg	4.57E-01	6.16E+00	6.17E+00	5.75E+00	3.43E+00
RWD	kg	2.89E-03	5.06E-03	5.06E-03	5.41E-03	8.42E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

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Table 21. Environmental profiles (A1-A3), concrete for special applications, Murray East/Hume (VIC), per m^3

Indicator	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	**kg CO_2 eq**	**288**	**322**	**365**	**451**	**473**	**499**	**529**
ODP	kg CFC11 eq	6.87E-06	7.47E-06	8.17E-06	9.65E-06	1.08E-05	1.20E-05	1.39E-05
AP	kg SO_2 eq	0.970	1.08	1.22	1.50	1.71	1.92	2.24
EP	kg PO_4^{3-} eq	0.161	0.178	0.201	0.245	0.264	0.286	0.315
POCP	kg C_2H_4 eq	0.0709	0.0777	0.0859	0.103	0.114	0.128	0.147
ADPE	kg Sb eq	2.17E-06	2.56E-06	2.87E-06	3.29E-06	6.34E-06	1.29E-05	1.48E-05
ADPF	MJ_{NCV}	2120	2350	2640	3230	3510	3840	4270

Table 22. Environmental parameters (A1-A3), concrete for special applications, Murray East/Hume (VIC), per m^3

Parameter	Unit	HIGH SLUMP 20 MPa	HIGH SLUMP 25 MPa	HIGH SLUMP 32 MPa	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ_{NCV}	2.16E+01	2.39E+01	2.67E+01	3.18E+01	3.66E+01	4.49E+01	5.06E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-02	1.44E-01	1.35E-01
PERT	MJ_{NCV}	2.16E+01	2.39E+01	2.67E+01	3.18E+01	3.67E+01	4.51E+01	5.07E+01
PENRE	MJ_{NCV}	2.12E+03	2.35E+03	2.63E+03	3.21E+03	3.51E+03	3.86E+03	4.34E+03
PENRM	MJ_{NCV}	5.25E+00	6.61E+00	7.59E+00	8.52E+00	1.14E+01	2.00E+01	2.91E+01
PENRT	MJ_{NCV}	2.13E+03	2.35E+03	2.64E+03	3.22E+03	3.52E+03	3.88E+03	4.37E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E+01	1.61E+02	2.96E+02
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.18E+00	4.34E+00	4.46E+00	4.72E+00	4.71E+00	4.88E+00	4.99E+00
HWD	kg	5.65E-06	7.16E-06	8.15E-06	9.14E-06	1.90E-05	4.17E-05	5.01E-05
NHWD	kg	9.64E-02	1.09E-01	1.20E-01	1.37E-01	6.60E-01	1.72E+00	1.67E+00
RWD	kg	9.83E-04	1.24E-03	1.42E-03	1.59E-03	2.54E-03	4.94E-03	6.56E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	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	0.00E+00

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Table 23. Environmental profiles (A1-A3), concrete for special applications, Murray East/Hume (VIC), per m^3

Indicator	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
GWP	**kg CO_2 eq**	**328**	**412**	**440**	**422**	**427**	**459**
ODP	kg CFC11 eq	8.65E-06	1.05E-05	9.37E-06	8.98E-06	9.89E-06	1.04E-05
AP	kg SO_2 eq	1.28	1.62	1.46	1.40	1.51	1.61
EP	kg PO_4^{3-} eq	0.192	0.239	0.239	0.229	0.235	0.252
POCP	kg C_2H_4 eq	0.0885	0.109	0.100	0.0959	0.107	0.114
ADPE	kg Sb eq	1.21E-06	1.44E-06	3.43E-06	3.26E-06	2.96E-06	3.03E-06
ADPF	MJ_{NCV}	2530	3150	3150	3020	3190	3400

Table 24. Environmental parameters (A1-A3), concrete for special applications, Murray East/Hume (VIC), per m^3

Parameter	Unit	TREMIE 40 MPa	TREMIE 50 MPa	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	SHOTCRETE 40 MPa
PERE	MJ_{NCV}	2.37E+01	2.90E+01	3.14E+01	3.01E+01	7.38E+01	7.57E+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}	2.37E+01	2.90E+01	3.14E+01	3.01E+01	7.38E+01	7.57E+01
PENRE	MJ_{NCV}	2.56E+03	3.19E+03	3.13E+03	3.00E+03	3.15E+03	3.37E+03
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	9.29E+00	8.74E+00	6.01E+00	6.01E+00
PENRT	MJ_{NCV}	2.56E+03	3.19E+03	3.14E+03	3.01E+03	3.16E+03	3.37E+03
SM	kg	1.04E+02	1.46E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.32E+00	4.64E+00	4.61E+00	4.40E+00	2.41E+01	2.42E+01
HWD	kg	0.00E+00	0.00E+00	9.96E-06	9.38E-06	6.97E-06	6.97E-06
NHWD	kg	7.79E-02	9.10E-02	1.39E-01	1.34E-01	1.19E-01	1.24E-01
RWD	kg	0.00E+00	0.00E+00	1.73E-03	1.63E-03	1.20E-03	1.20E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Murray East/Hume Region

Table 25. Environmental profiles (A1-A3), concrete for special applications, Murray East/Hume (VIC), per m^3

Indicator	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
GWP	**kg CO_2 eq**	**70.2**	**103**	**374**	**331**	**91.0**
ODP	kg CFC11 eq	2.12E-06	2.67E-06	8.24E-06	7.51E-06	3.52E-06
AP	kg SO_2 eq	0.246	0.351	1.25	1.11	0.331
EP	kg PO_4^{3-} eq	0.0427	0.0595	0.205	0.182	0.0584
POCP	kg C_2H_4 eq	0.0200	0.0264	0.0871	0.0786	0.0324
ADPE	kg Sb eq	2.52E-07	3.26E-07	2.75E-06	2.45E-06	5.91E-07
ADPF	MJ_{NCV}	570	790	2700	2400	770

Table 26. Environmental parameters (A1-A3), concrete for special applications, Murray East/Hume (VIC), per m^3

Parameter	Unit	STABILISED SAND 3%	STABILISED SAND 5%	KERB MACHINE 320KG/M3	KERB MACHINE 280KG/M3	NO FINES 4%
PERE	MJ_{NCV}	7.19E+00	9.05E+00	2.69E+01	2.42E+01	8.35E+00
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	7.19E+00	9.05E+00	2.69E+01	2.42E+01	8.35E+00
PENRE	MJ_{NCV}	5.79E+02	7.94E+02	2.69E+03	2.40E+03	7.86E+02
PENRM	MJ_{NCV}	0.00E+00	0.00E+00	6.99E+00	6.12E+00	0.00E+00
PENRT	MJ_{NCV}	5.79E+02	7.94E+02	2.69E+03	2.40E+03	7.86E+02
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.02E+00	3.15E+00	4.32E+00	4.16E+00	2.63E+00
HWD	kg	0.00E+00	0.00E+00	7.50E-06	6.56E-06	0.00E+00
NHWD	kg	2.68E-02	3.16E-02	1.17E-01	1.06E-01	4.00E-02
RWD	kg	0.00E+00	0.00E+00	1.31E-03	1.14E-03	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Other environmental information

Water management

Water is a valuable resource and good quality fresh water is essential to our concrete, construction material and plasterboard operations. We use water in manufacturing, and for dust suppression, cleaning and sanitation. Our quarry and asphalt operations are able to use recycled, brackish and/or process water.

At our larger sites, including quarries, we also capture rainfall or stream flow that is largely used for dust control purposes. We are developing systems that will enable us to collect data on captured rainfall and are developing plans that will underpin an overall improvement in water efficiency.

When developing or purchasing new facilities, our due diligence assessment includes scenario analysis of the quantity and quality of water, assessment of the risks of potential water discharges, and, where relevant, river catchment assessments to ensure sufficient water availability and supply.

Waste and recycling

Throughout Boral's operations, some materials are commonly re-used back into our production processes. Returned concrete is used to make concrete blocks at some plants. This beneficially uses materials that would otherwise require disposal. A large proportion of Boral's recycled and lower carbon products revenue, totalling nine per cent of Boral Limited revenue, is derived from external waste products.

This includes our fly ash and recycling businesses. Opportunities for the re-use of production by-products or waste material continues to grow and are actively being pursued.

Biodiversity management

Protecting the diversity of plant and animal species at and around our operational sites is a core component of our land management efforts. Some examples of the many initiatives to protect biodiversity at our own sites include:

- Conservation work to provide habitat for the threatened legless lizard and spiny rice-flower at Deer Park Quarry in Victoria.
- Maintaining koala fodder plantations at Narangba and Petrie quarries in Queensland.
- Collaborating with the Royal Botanic Garden Sydney NSW in research on the endangered Illawarra Socketwood population at our Dunmore Quarry in New South Wales.
- Partnering with Sleepy Burrows Wombat Sanctuary to capture and relocate wombats found at our Peppertree Quarry in New South Wales.
- Boral in WA has completed a number of community projects at Orange Grove Primary School including a Heritage Garden space, installation of garden pathways and cockatoo nesting boxes.
- Construction of a bird island habitat as part of our rehabilitation of wetlands at our Dunmore Quarry in New South Wales.
- Through our community partnership with Conservation Volunteers Australia, we support conservation and education initiatives in our local communities, including native vegetation initiatives in local reserves and schools.

Our approach to climate related risks

Our approach

Boral recognises that climate related physical risks and a global transition to a lower-carbon future are expected to impact our operations, customers and suppliers. We support the Paris Agreement and mechanisms to achieve its objective of limiting future average global temperature rises to well below 2°C, as well as Australia's 2030 target of a 26–28% reduction in carbon emissions below 2005 levels.

Looking at how Boral's carbon emissions are tracking relative to 2005 levels, in Australia we have reduced emissions by around 40% since FY2005. We achieved about half of this decrease largely by realigning our portfolio away from emissions-intensive businesses. The remainder of the decrease is due to reducing clinker manufacturing in Australia in favour of importing it from more efficient and larger scale operations in Asia. Including Boral North America, our Scope 1 and 2 emissions decreased by 43% since FY2005. We continue to progressively adopt the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). In FY2019, we enhanced our climate-related governance and risk management, completed scenario analysis of Boral Cement's business and continued to strengthen our resilience to a 2°C scenario. We also broadened our reporting of physical climate-related risks and Scope 3 emissions.

We completed a Group-wide review of our climate-related risks and opportunities using the TCFD framework. This review informed a two-year roadmap to undertake further scenario analysis of key climate related business risks. We transparently and constructively engaged with Climate Action 100+ investor representatives and other stakeholders during the year, sharing our progress in aligning our efforts with the TCFD recommendations and building greater resilience to climate-related impacts.

Our approach to climate related risks

Energy and climate policy

Boral has not identified any major positions on energy and climate policy held by our industry associations that are materially inconsistent with Boral's position.

We support:

- A national approach to climate and energy policy to ensure that least-cost carbon emissions abatement is targeted while ensuring reliable and competitive energy can be delivered.
- Climate and energy policies that do not unduly erode the competitiveness of domestic-based businesses.

Through our community partnership with Conservation Volunteers Australia, we support conservation and education initiatives in our local communities, including native vegetation initiatives in local reserves and schools.

In Australia, we are a member of the Cement Industry Federation (CIF). The CIF policy is to support the Federal Government's national target to reduce emissions by 26–28 per cent by 2030, and the CIF has been working with the World Business Council for Sustainable Development and its current roadmap to reduce emissions.

Boral acknowledges the Paris Agreement and supports mechanisms to achieve its objectives, including a national approach to climate and energy policy. Boral's major industry associations are:

- Green Building Council of Australia (GBCA)
- Infrastructure Sustainability Council (ISC)
- Concrete Institute of Australia (CIA)
- Australian Pozzolan Association (APozA)
- Business Council of Australia
- Cement Industry Federation
- Cement, Concrete & Aggregates Australia
- Australian Mines and Metals Association's Australian Resources and Energy Group
- American Coal Ash Association.

For more information visit boral.com/industry associations

References

AS/NZS 3972
General purpose and blended cements (SA 2010)

AS 3582.1
Supplementary cementitious materials
Part 1: Fly Ash (SA 2016)

AS 3582.2
Supplementary cementitious materials Part 2:
Slag - Ground granulated blast furnace (SA 2016)

AS 2758.1
Aggregates and rock for engineering purposes Part 1:
Concrete Aggregates (SA 2014)

AS 1478.1
Chemical admixtures for concrete, mortar and grout (SA 2000)

ACLCA 2019
American Center for Life Cycle Assessment (ACLCA), ACLCA Guidance to Calculating Non-LCIA Inventory Metrics in Accordance with ISO 21930:2017, PCR Committee, May 2019.

CEN 2013
EN 15804:2012+A1:2013, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, European Committee for Standardization (CEN), Brussels, November 2013.

CEN 2017
EN 16757:2017, Sustainability of construction works – Environmental product declarations - Product Category Rules for concrete and concrete elements, European Committee for Standardization (CEN), Brussels, November 2017.

EFCA 2015a
EPD of Plasticizer and superplasticizer, IBU EPD Declaration number EPD-EFC-20150091-IAG1-EN, issued 14-09-2015, based on EN 15804 and PCR for concrete admixtures; EPD owner: EFCA - European Federation of Concrete Admixtures Associations.

EFCA 2015b
EPD of Retarders, IBU EPD Declaration number EPD-EFC-20150088-IAG1-EN, issued 14-09-2015, based on EN 15804 and PCR for concrete admixtures; EPD owner: EFCA - European Federation of Concrete Admixtures Associations.

EFCA 2015c
EPD of Air entrainers, IBU EPD Declaration number EPD-EFC-20150086-IAG1-EN, issued 14-09-2015, based on EN 15804 and PCR for concrete admixtures; EPD owner: EFCA - European Federation of Concrete Admixtures Associations.

ENVIRONDEC 2020a
PCR2012:01 (version 2.33), Product category rules according to ISO 14025 and EN 15804, Combined PCR and PCR Basic Module for Construction products and Construction services, registration number 2012:01, published on 18 September 2020.

ENVIRONDEC 2020b
PCR 2012:01-Sub-PCR-G, Product category rules Concrete and concrete elements, 18 September 2020.

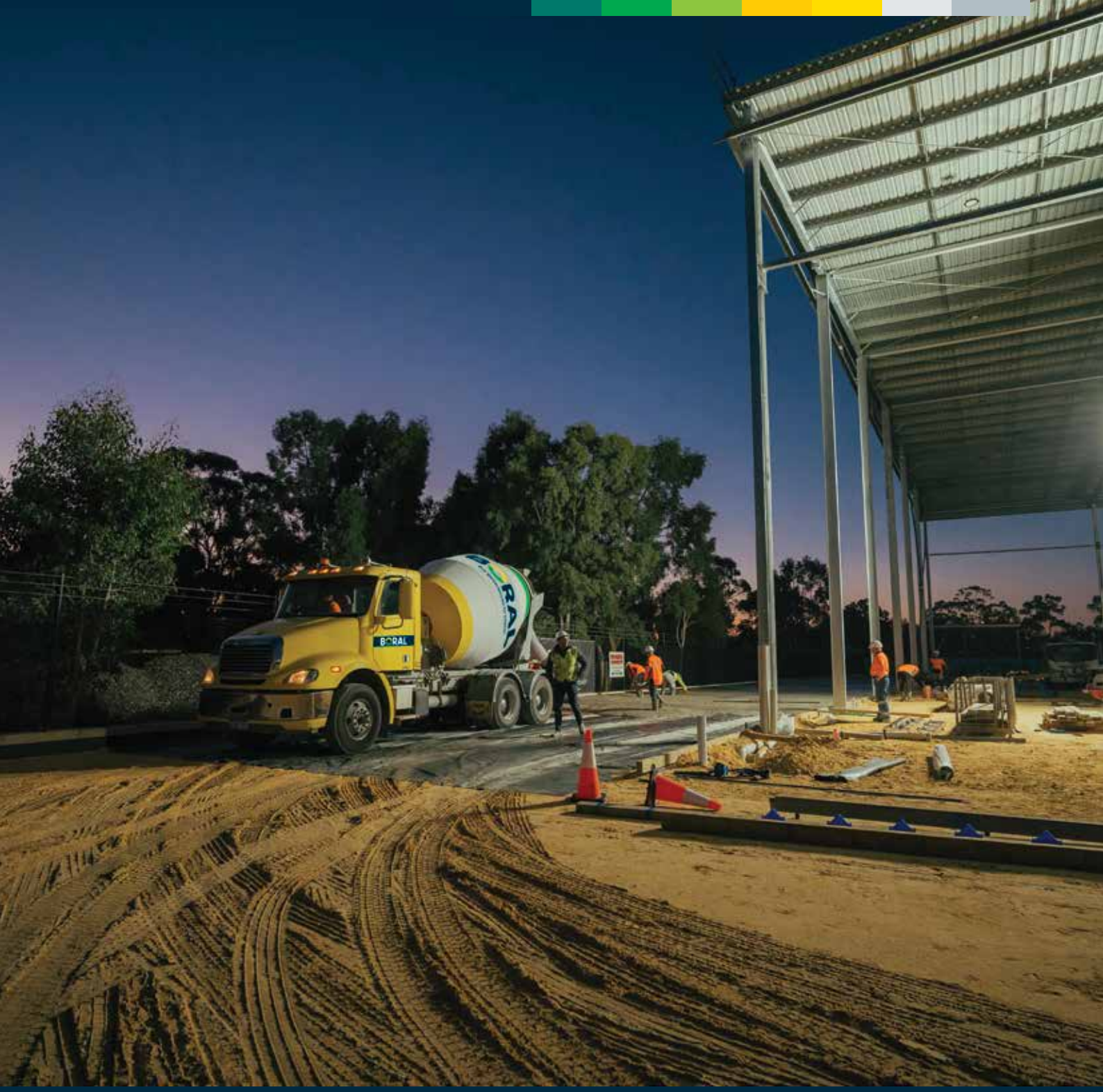
ISO 2006a
ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework. International Organization for Standardization, Geneva, Switzerland, 2006.

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

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

SA 2007
AS 1379:2007 Specification and supply of concrete, prepared by Committee BD-049 Manufacture of Concrete, published on 20 September 2007 (and reconfirmed in 2017) by Standards Australia, Sydney.

VICROADS
Section 610 - Structural Concrete specification



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