



# Hanson

HEIDELBERGCEMENT Group

## ECODOCS™

### ENVIRONMENTAL PRODUCT DECLARATION

In Accordance with Environdec c-PCR-003 Concrete, concrete elements (EN 16757), ISO 14025 and EN15804:A2

Programme: The International EPD® System

Programme Operator: EPD Australasia Limited

**Project Name: M-Park Stage 01**

**Location: Sydney, NSW**

**EPD Registration Number: S-P-03718**

**Date of Publication: 2021-09-08**

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Hanson is a leader in building and construction materials with an extensive production and logistics network across Australia.

Through world-class technologies and service platforms, we supply a comprehensive range of high-quality concrete, aggregates and sand. In addition, we also produce road base, asphalt and sustainable and recycled construction materials for civil construction and infrastructure projects.

Hanson is part of the HeidelbergCement Group, which employs over 59,000 people across five continents. HeidelbergCement is a global leader in aggregates and has leading positions in cement, concrete and heavy building products

Hanson is committed to giving back to the community. We proudly support local initiatives, charities and community groups. We host open days and sponsor education programs.

Engaging proactively with community stakeholders is important to us. We learn about specific needs and concerns to ensure minimal disruption for everyone.

We also employ locally to reduce travel times for our people and contribute to vital local infrastructure. It is our hope that this will better the lives of people in our communities and deliver seamless projects for customers.



## Driving economic strength and innovation

We will ensure sustainable profitability through the effective management of all processes and resources and the continuing innovation of products and services.

- We adopt a systematic and integrated approach to all aspects of our business and are committed to complying with AS4801/ISO45001, ISO9001, ISO14001, NHVAS accreditation supported by a continuous improvement culture.
- We continue to invest in innovation and development to improve the sustainable performance of our products designed to meet the needs of our customers.



## Achieving excellence in occupational health and safety

We are committed to continuously enhancing the occupational health, safety & wellbeing of our employees, contractors and communities.

For further information see our policies on Risk Management and Health & Safety.



## Enhancing our environmental outcomes

We are committed to fulfilling our share of the global responsibility to keep temperature rise below 2°C, and we will continue to reduce our impacts on air, land and water.

- Products will be measured as to their embodied carbon and action will be taken to reduce the impact of products on a unit rate basis with the aim of reducing our product carbon footprint by 30% by 2030 compared with 1990 performance.
- Operations will have an after-use plan that considers the needs of local communities & the environment. Where the site is in a nature conservation area, the after-use plan will include a biodiversity management section that aims to have a net positive biodiversity impact.
- For further information see our policies on energy, environment and water.



## Enabling a circular economy

We conserve our natural reserves by increasing our portfolio of products that include recycled materials & by-products.

- Use of natural materials alternatives will be increased by expanding the footprint and broadening the product range.
- The waste management hierarchy will be implemented in our operations to minimize waste disposal.



## Being a good neighbour

We are committed to supporting the social and economic development of our neighbouring communities and ensuring transparent communication with all our stakeholders.

- All operations will engage positively & transparently with their communities. This includes but is not limited to 1) supporting local businesses; and 2) engaging in one hour per year of volunteering per full time equivalent employee.



## Ensuring compliance and creating transparency

We adhere to international human rights, anti-corruption and labour standards and co-operate pro-actively in an open and transparent manner with all our stakeholders.

- Hanson does not engage in modern slavery of any form & will not engage with organisations that do.
- National sustainability performance measures will be implemented for the purposes of performance improvement. Hanson will be transparent about its sustainability performance.
- For further information see our Anti-corruption Guideline, Supplier Code of Conduct, Inclusion & Diversity Policy and Human Rights Position.

Hanson is committed to improving the world around us and the lives of people within it.

We believe companies that succeed in the future will be those that continuously invest in people, innovation, environment and ethical governance – and focus on delivering long-term benefits, not just immediate goals.

Every day we engage with employees, local communities and stakeholders to drive sustainable work practices. Our Sustainability policy (left) is built into our company strategy and embedded across the Hanson workforce, right up to senior management level.

Our approach to sustainability is about looking to the future while continually improving environmental outcomes.

With extensive global and local research capability, Hanson focuses on advancing technology that reduces the environmental impact of production techniques and increases the effectiveness of site rehabilitation programs.

Our commitment to is encapsulated in the six policy topics, outlined to the left.



**REDUCE THE ENVIRONMENTAL IMPACT OF YOUR BUILDING WITHOUT COMPROMISING ON QUALITY**

**BENEFITS**

The Sustainable by Hanson range includes standard, specialist application and high performance products with a specified minimum quantity of supplementary cementitious materials (SCMs) to guarantee a reduction in overall embodied carbon for your building project.\*

\*Please discuss your desired % of reduced embodied carbon with your Sales Rep. Hanson refers to Reference Case Portland cement contents classified by standard grades of concrete as described in AS3329.

- 
**SUSTAINABLE**  
 Sustainable by Hanson concrete contains recycled and by-product materials to reduce the environmental impact of your building project.
- 
**PERFORMANCE**  
 Sustainable by Hanson is as strong, high performing and at least as durable as its regular counterparts.
- 
**WIDE RANGE**  
 Sustainable by Hanson products are available to suit a wide range of applications.
- 
**COMPLIANCE**  
 Sustainable by Hanson can help you to meet sustainability requirements such as Greenstar ratings or energy efficiency targets.\*\*

\*\*Hanson also offers a specific Greenstar range of products, or can design mixes to your individual sustainability needs.

**Hanson**  
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hanson.com.au | 1300 136 464

In 2021, Hanson introduced 'Sustainable by Hanson' – a range designed to assist you in choosing products with lower environmental impacts. The range employs high levels of supplementary cementitious material as a replacement for ordinary Portland cement.

Covering a broad range of applications, the products can be supplied from many of our operations nationwide. Planning to utilize Sustainable by Hanson can significantly reduce the total environmental impact of your project while not compromising on quality.

For further information, go to our website or call us on 1300 136 464.

## Declared Unit is 1m<sup>3</sup> of Concrete

The process is used to produce an accurate estimation at all stages of the product life cycle from cradle to grave. Estimation at each stage is based on actual data which is a combination of both current and prior year average consumption per declared unit.

## Life Cycle Assessment Tool

The Global Cement & Concrete Association (GCCA) are responsible for the Life Cycle Assessment (LCA) tool (GCCA Tool) employed that was originally developed for the Cement Sustainability Initiative (CSI) led by the World Business Council for Sustainable Development (WBCSD). For the purposes of creating this Environmental Product Declaration (EPD), the GCCA Tool has been employed.

EPDs are created under either of 2 streams:

- **Generic Stream** - The class of product modelled is used for a particular geographical region using averaged data across operations.
- **Project-specific stream** – Models the manufacture of specific products required for a particular project being delivered from specific plant(s) using weighted average data where relevant and possible.

The main data categories include:

- The average BOM for the concrete mix selected in the range of concrete plants specified including their average raw material travel distance;
- The average fuel, water and energy consumption per declared unit between those plants;
- Plant production waste based on a nationally calculated figure;
- Recarbonation of concrete is determined through pre-defined values within GCCA tool for the type of construction project, where known; and,
- End of life recycling is based upon industry data.

This EPD Process is certified using GCCA international modelling of energy use and environmental impact to obtain a suitable estimation for products manufactured.

Pre-defined cement and clinker data provided by the GCCA tool are used only where no better (supplier/source specific) information is available.

## Assumptions & Limitations

- All modelling assumptions adopted from the GCCA Tool.
- Raw material (inbound) transport distances is the previous year's travel distance average weighted according to deliveries across operations.
- For generic EPDs (i.e. not created for projects), travel from concrete production site to customer site is calculated is the previous year's travel distance average weighted according to deliveries across operations.
- Concrete mixes are assumed to use an equal amount of site fuel and energy and responsible for an equal amount of waste flows.
- Production is assumed to be equal across all plants included in the study for the calculation of the bill of materials.
- Water usage in operations is averaged over the full geographic region of study.
- Grid purchased electricity mixes is based on the specific state's energy mix excluding imports.
- Travel for materials sources internationally included from shipping origin.

The contents of the materials contained in the subject mixes are contained in the table, illustrated by percentage of weight.

| Bill of Materials                    | Low Level % | High Level % |
|--------------------------------------|-------------|--------------|
| Cement                               | 10%         | 12%          |
| Supplementary Cementitious Materials | 7%          | 8%           |
| Aggregates                           | 72%         | 75%          |
| Water                                | 8%          | 9%           |
| Admixtures                           | >1%         | >1%          |

## Hazard information related to concrete placement

GHS classifications

- Skin Corrosion Category 1
- Serious Eye Damage –Category 1
- Skin Sensitisation Category 1
- Specific Target Organ Toxicity (Repeated Exposure) Category 2

Hazard Statement(s)

- H302 –Harmful if swallowed
- P280 –Wear protective gloves/clothing/eye protection.
- H314 –Causes severe skin burns and eye damage
- H317 –May cause an allergic skin reaction
- H318 –Causes serious eye damage
- H373 –May cause damage to lungs by inhalation (dust from dried product)

## By-Products, Recycled Materials & Allocations

The following materials are the product of waste streams of other industrial processes:

- Fly ash
  - A by-product of coal-fired power stations, fly ash is considered to carry no environmental impact for the purposes of this EPD.
- Ground Granulated Blast Furnace Slag (GGBFS)
  - Blast furnace slag is a by-product of steel production that is dried and ground for use in concrete production. To duly allocate the environmental impacts, economic allocation has been employed.
- Silica fume
  - As a by-product of silicon production, silica fume is considered to carry no environmental burden for the purposes of this EPD.

## Packaging

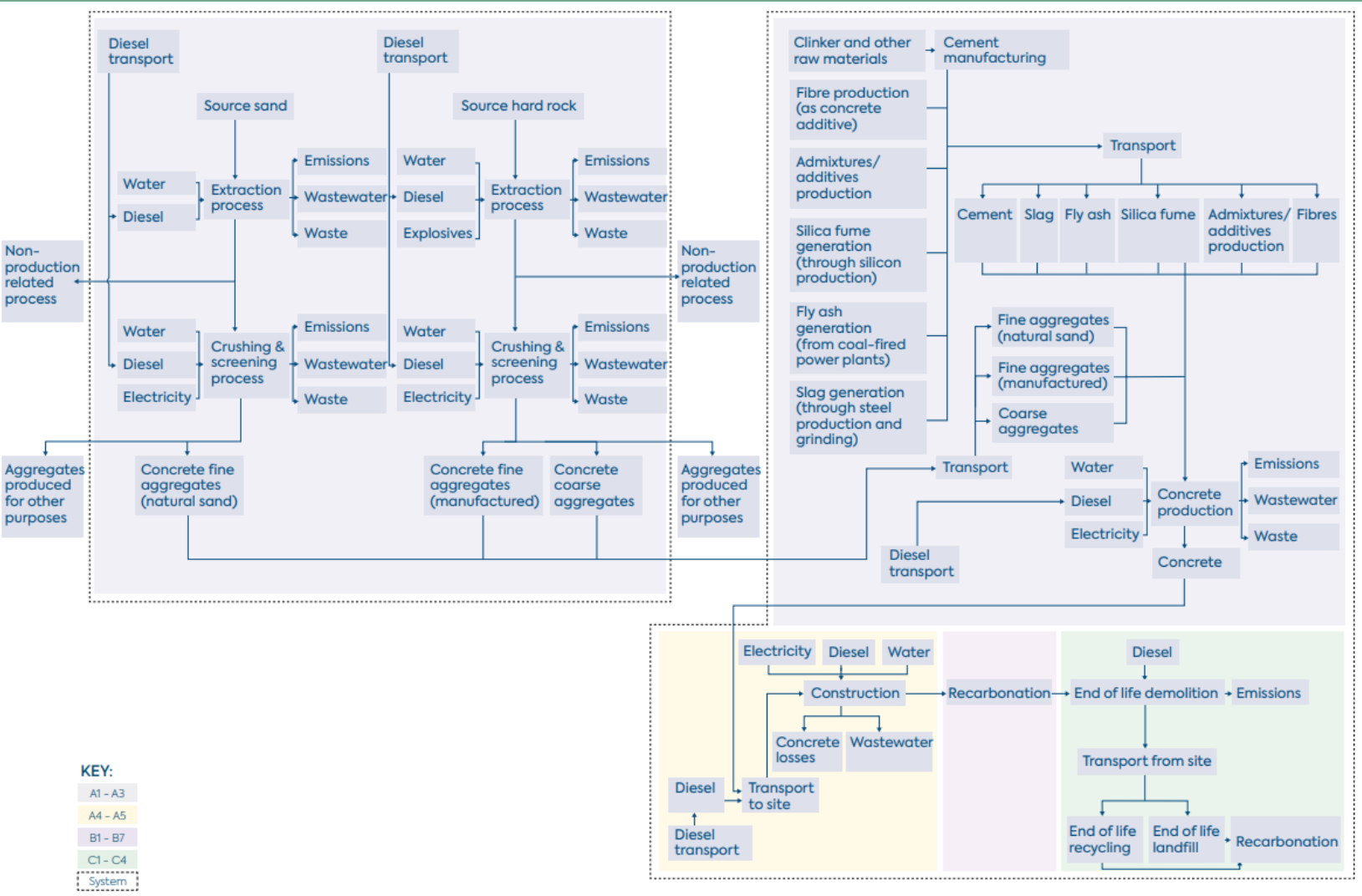
This concrete is not produced with any packaging, instead delivered directly to site immediately following production.

| Product Stage       |           |               | Construction Stage |                                   | Use Stage |                             |                        |                             |                               |                        |                       | End of Life Stage            |           |                  |                | Benefits & loads for the next product system |
|---------------------|-----------|---------------|--------------------|-----------------------------------|-----------|-----------------------------|------------------------|-----------------------------|-------------------------------|------------------------|-----------------------|------------------------------|-----------|------------------|----------------|----------------------------------------------|
| Raw Material Supply | Transport | Manufacturing | Transport          | Construction/installation process | Use       | Maintenance incl. transport | Repair incl. transport | Replacement incl. transport | Refurbishment incl. transport | Operational Energy Use | Operational Water Use | De-construction & demolition | Transport | Re-use recycling | Final Disposal | Reuse, Recovery Recycling                    |
|                     |           |               |                    |                                   |           |                             |                        |                             |                               |                        |                       |                              |           |                  |                |                                              |
| A1                  | A2        | A3            | A4                 | A5                                | B1        | B2                          | B3                     | B4                          | B5                            | B6                     | B7                    | C1                           | C2        | C3               | C4             | D1                                           |
| ✓                   | ✓         | ✓             | ✓                  | ✓                                 | ✓         | N/A                         | N/A                    | N/A                         | N/A                           | N/A                    | N/A                   | ✓                            | ✓         | ✓                | ✓              | ✓                                            |

All stages of the product lifecycle have been considered for this EPD – cradle to grave. By its nature, there are some stages of the lifecycle that are not applicable to the concrete product. These have been marked NA (not applicable).

Those stages that, due to practicality, cannot be assessed accurately draw on default values of the underlying GCCA tool.

For Project-specific EPDs, allocation is determined by the supplying plants with estimates as to the likely volume to be delivered from each. Where existing and sufficient data exists, historical data will be used to make this determination.



The lifecycle model and system boundary is the same for both Generic and Project-specific concrete EPDs, as detailed in the graphic.

All stages of the lifecycle, from quarry to recycling are covered by the EPD. No exclusion is made for anything relevant to the outcome of the product.

| LCA Stage                          | Item                                                             | Source                                                                                                                                                                                                                                                                                                                                                   | Timing                                                                                                                                                               | Data Quality      |
|------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Product Description                | Product description and density                                  | ERP report Bill of Materials and material specific data                                                                                                                                                                                                                                                                                                  | Upon EPD creation                                                                                                                                                    | High, Primary     |
| A1-3 Materials                     | Raw Materials                                                    | ERP report BOM and Mix design compilation used in conjunction with material template<br><br>Note. Upstream process for raw materials utilise data from ecoinvent 3.5. Cement and Clinker details to be provided by cement producer or, where not available, GCCA Tool default data used in conjunction with ecoinvent 3.5.                               | Upon EPD creation                                                                                                                                                    | High, Secondary   |
| A1-3 Materials                     | Inbound travel (raw materials)                                   | ERP report 2. Inbound Travel drawing from actual deliveries from sources to operations.<br><br>Where delivery data not available, travel calculated based on Google Maps.<br><br>Train travel (only for operations around Melbourne) calculated by actual Google Maps distance.<br>Slag: AusLCI                                                          | Full prior year data, average per delivery<br><br>Actual travel distances between source and operation.<br><br>Actual travel distances between source and operation. | High, Primary     |
| A1-3 Materials                     | Allocation Factor (for secondary co products e.g. Slag, Fly Ash) | Fly Ash & Silica fume: no allocation as they are industrial by-products.                                                                                                                                                                                                                                                                                 | Upon EPD creation (latest information available)                                                                                                                     | Secondary, Medium |
| A1-3 Manufacturing                 | Plant Energy and Fuel Consumption                                | ERP Report 3. Concrete Energy Use, drawing on actual invoiced usage.                                                                                                                                                                                                                                                                                     | Full prior year data, average per metre                                                                                                                              | Primary, High     |
| A1-3 Manufacturing                 | Electricity Energy Sources                                       | <a href="https://opennem.org.au">https://opennem.org.au</a> ; Australian Energy Market Operator.                                                                                                                                                                                                                                                         | Full year prior data, percentages                                                                                                                                    | Secondary, High   |
| A1-3 Waste Management              | Waste and waste water                                            | ERP report 4 Waste Production, actual invoiced data with allocation estimation based on process flows.                                                                                                                                                                                                                                                   | Full prior year data, average per metre. Estimation based on expenditure.                                                                                            | Secondary, Medium |
| A4-5 Construction                  | Outbound Travel                                                  | ERP report 5. Outbound travel drawing from actual deliveries from operations to customer sites. Where data not available, travel calculated based on Google Maps.                                                                                                                                                                                        | Full prior year data, average per delivery                                                                                                                           | Primary, High     |
| B. Use                             | Re-carbonation                                                   | Default GCCA Tool settings                                                                                                                                                                                                                                                                                                                               | NA                                                                                                                                                                   | Proxy, Medium     |
| C. End of Life Demolition          | Demolition                                                       | Default GCCA Tool settings                                                                                                                                                                                                                                                                                                                               | NA                                                                                                                                                                   | Proxy, Medium     |
| C. End of Life Transport           | Transport                                                        | Default GCCA Tool settings                                                                                                                                                                                                                                                                                                                               | NA                                                                                                                                                                   | Proxy, Medium     |
| C. End of Life<br>Waste Processing | Recycling Rate at EOL                                            | Masonry materials recycling rate obtained from annual National Waste Report published (eg. For National Waste Report 2020 page 38)<br><br><a href="https://www.environment.gov.au/protection/waste/publications/national-waste-reports">https://www.environment.gov.au/protection/waste/publications/national-waste-reports</a>                          | Prior year National Waste Report if available. If not, then latest available                                                                                         | Proxy, Medium     |
| C. End of Life<br>Disposal         | Disposal Rate at EOL                                             | Disposal rate inverse of masonry materials recycling rate obtained from annual National Waste Report published (eg. For National Waste Report 2020 page 38)<br><br><a href="https://www.environment.gov.au/protection/waste/publications/national-waste-reports">https://www.environment.gov.au/protection/waste/publications/national-waste-reports</a> | Prior year National Waste Report if available. If not, then latest available                                                                                         | Proxy, Medium     |
| D Benefits and Loads               |                                                                  | Default GCCA Tool settings                                                                                                                                                                                                                                                                                                                               | NA                                                                                                                                                                   | NA                |
| General                            | General                                                          | Ecoinvent database.<br><br>Note: This covers environmental information for all raw materials and energy sources. Cement, where data is available, employs specific raw material and energy data for the product manufacture and for each component draws on Eco Invent Data.                                                                             | As updated                                                                                                                                                           | Secondary, High   |

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COMMENT                              | <p>All information about goal and scope necessary for results interpretation are present in the latest version of the “LCA Model” report, available in GCCA’s Industry EPD Tool. The tool does not include the input or calculation of the biogenic carbon content of the product or packaging. Yet, the PCR requires that the latter should be reported in an EPD. It is mandatory when the biogenic carbon content exceeds 5% wt. (product or packaging). The latter are calculated as the quantity of biogenic carbon in the product (resp. in the packaging) per declared unit multiplied by 44/12, reported in kg CO2 per declared unit.</p> <p>The removals and emissions associated with biogenic carbon content of i) the product and ii) the packaging are not calculated and therefore not reported in the tool. The latter are not significant or even not relevant in the sector. The only limitation is the uptake of CO2 in A1-A3 (e.g. biobased insulation materials in precast elements or bio based packaging materials) and reemission in A5 (packaging end-of-life) or C3-C4 (product end-of-life). This does not affect the GWP-tot indicator.</p> <p>The GWP-GHG indicator is not calculated and therefore not reported in the present EPD. Given the statement above, the GWP-GHG indicator can be assimilated to the GWP-tot indicator. The tool does not calculate the ‘Radioactive waste disposed’ indicator, it is considered not to be significant for the sector.</p> |
| CORE ENVIRONMENTAL IMPACT INDICATORS | <p><b>GWP-tot</b> (Global Warming Potential total) • <b>GWP-fos</b> (Global Warming Potential fossil fuels) • <b>GWP-bio</b> (Global Warming Potential biogenic) • <b>GWP-luc</b> (Global Warming Potential land use and land use change) • <b>ODP</b> (Depletion potential of the stratospheric ozone layer) • <b>AP</b> (Acidification potential, Accumulated Exceedance) • <b>EP-fw</b> (Eutrophication potential, fraction of nutrients reaching freshwater end compartment) • <b>EP-fw*</b> (Eutrophication potential, fraction of nutrients reaching freshwater end compartment*) • <b>EP-mar</b> (Eutrophication potential, fraction of nutrients reaching marine end compartment) • <b>EP-ter</b> (Eutrophication potential, Accumulated Exceedance) • <b>POCP</b> (Formation potential of tropospheric ozone) • <b>ADPE</b> (Abiotic depletion potential for non- fossil resources) • <b>ADPF</b> (Abiotic depletion for fossil resources potential) • <b>WDP</b> (Water (user) deprivation potential, deprivation-weighted water consumption)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS | <b>PM</b> (Potential incidence of disease due to PM emissions) • <b>IRP</b> (Potential Human exposure efficiency relative to U235) • <b>ETP</b> (Potential Comparative Toxic Unit for ecosystems) • <b>HTPC</b> (Potential Comparative Toxic Unit for humans - cancer) • <b>HTPNC</b> (Potential Comparative Toxic Unit for humans - non-cancer) • <b>SQP</b> (Potential soil quality index)                                                                                                                                                                                                                                                                                                                                               |
| PARAMETERS DESCRIBING RESOURCE USE         | <b>PERE</b> (Use of renewable primary energy excluding renewable primary energy resources used as raw materials) • <b>PERM</b> (Use of renewable primary energy resources used as raw materials) • <b>PERT</b> (Total use of renewable primary energy resources) • <b>PENRE</b> (Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials) • <b>PENRM</b> (Use of non-renewable primary energy resources used as raw materials) • <b>PENRT</b> (Total use of non-renewable primary energy resources) • <b>SM</b> (Use of secondary materials) • <b>RSF</b> (Use of renewable secondary fuels) • <b>NRSF</b> (Use of non-renewable secondary fuels) • <b>NFW</b> (Net use of fresh water) |
| WASTE CATEGORIES                           | <b>HWD</b> (Hazardous waste disposed) • <b>NHWD</b> (Non-hazardous waste disposed) • <b>RWD</b> (Radioactive waste disposed)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| OUTPUT FLOWS                               | <b>CRU</b> (Components for re-use) • <b>MFR</b> (Materials for recycling) • <b>MER</b> (Materials for energy recovery) • <b>EE</b> (Exported energy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| EXTRA INDICATORS                           | <b>CC</b> (Emissions from calcination and removals from carbonation) • <b>CWRS</b> (Emissions from combustion of waste from renewable sources used in production processes) • <b>CWNRS</b> (Emissions from combustion of waste from non-renewable sources used in production processes)                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| DECLARED UNIT          | 1m³                                                                            |
| PRODUCT IDENTIFICATION | Pump 40MPa - 40% Indicative Cement Reduction, GGBFS                            |
| PRODUCTION SITE(S)     | Sydney                                                                         |
| COMPRESSIVE STRENGTH   | 40                                                                             |
| DENSITY                | 2434.77 kg/m³                                                                  |
| REFERENCE SERVICE LIFE | 50 Years                                                                       |
| RECYCLING RATE AT EOL  | 82%                                                                            |
| SCOPE                  | A1-A3 + A4-A5 + B1-B7 + C1-C4 + D, cradle-to-grave                             |
| METHODOLOGY            | GCCA's Industry EPD Tool for Cement and Concrete (V3.0), International version |
| REFERENCE YEAR         | 2021-01-10                                                                     |

## CORE ENVIRONMENTAL IMPACT INDICATORS

|         |                         | A1-A3    | A4       | A5        | B1        | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4        | D         |
|---------|-------------------------|----------|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|
| GWP-tot | kg CO <sub>2</sub> eq.  | 2.93E+02 | 1.72E+00 | 1.16E+01  | -1.50E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.99E+00 | 9.32E+00 | 5.11E+00 | -7.66E-01 | -1.53E+01 |
| GWP-fos | kg CO <sub>2</sub> eq.  | 2.93E+02 | 1.72E+00 | 1.16E+01  | -1.50E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.99E+00 | 9.31E+00 | 5.07E+00 | -7.68E-01 | -1.52E+01 |
| GWP-bio | kg CO <sub>2</sub> eq.  | 9.78E-02 | 6.75E-04 | 4.88E-03  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.60E-03 | 6.66E-03 | 2.09E-02 | 1.59E-03  | -6.13E-02 |
| GWP-luc | kg CO <sub>2</sub> eq.  | 6.80E-02 | 5.83E-04 | 3.71E-03  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.13E-03 | 5.41E-03 | 1.59E-02 | 1.29E-03  | -2.66E-02 |
| ODP     | kg CFC 11 eq.           | 1.00E-05 | 3.28E-07 | 1.33E-06  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.62E-06 | 1.57E-06 | 4.03E-07 | 7.84E-07  | -1.04E-06 |
| AP      | mol H <sup>+</sup> eq.  | 1.43E+00 | 8.92E-03 | 9.76E-02  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.42E-02 | 5.62E-02 | 4.27E-02 | 2.30E-02  | -1.08E-01 |
| EP-fw   | kg PO <sub>4</sub> eq.  | 1.96E-01 | 3.94E-04 | 7.33E-03  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.23E-03 | 3.82E-03 | 1.02E-02 | 8.64E-04  | -1.96E-02 |
| EP-fw*  | kg P eq.                | 1.96E-01 | 3.94E-04 | 7.33E-03  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.23E-03 | 3.82E-03 | 1.02E-02 | 8.64E-04  | -1.96E-02 |
| EP-mar  | kg N eq.                | 4.13E-03 | 1.12E-05 | 7.07E-04  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.34E-05 | 9.20E-05 | 2.30E-04 | 2.66E-05  | -4.13E-04 |
| EP-ter  | mol N eq.               | 2.88E+00 | 3.19E-02 | 3.45E-01  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.44E-01 | 1.98E-01 | 7.97E-02 | 8.26E-02  | -2.69E-01 |
| POCP    | kg NMVOC eq.            | 7.89E-01 | 9.62E-03 | 9.51E-02  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.22E-01 | 5.80E-02 | 2.25E-02 | 2.42E-02  | -6.82E-02 |
| ADPE    | kg Sb eq.               | 2.13E-04 | 3.21E-06 | 7.62E-06  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.66E-06 | 1.65E-05 | 4.97E-06 | 2.62E-06  | -1.74E-04 |
| ADPF    | MJ, net calorific value | 1.95E+03 | 2.66E+01 | 1.34E+02  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.29E+02 | 1.34E+02 | 6.96E+01 | 6.60E+01  | -1.55E+02 |
| WDP     | m³ world eq. deprived   | 9.96E+01 | 2.00E-01 | -1.14E+00 | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.67E-01 | 1.20E+00 | 1.16E+00 | 3.24E+00  | -2.96E+01 |

## ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

|       |                   | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|-------|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PM    | Disease incidence | 1.02E-05 | 1.59E-07 | 1.71E-06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.45E-06 | 8.69E-07 | 3.81E-07 | 4.30E-07 | -1.27E-06 |
| IRP   | kBq U235 eq.      | 5.91E+03 | 1.43E+02 | 6.08E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.08E+02 | 7.96E+02 | 8.89E+02 | 3.09E+02 | -1.43E+03 |
| ETP   | CTUe              | 9.10E+01 | 5.73E+00 | 4.63E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.76E+00 | 2.44E+01 | 1.74E+00 | 1.26E+00 | -7.38E+00 |
| HTPC  | CTUh              | 1.08E-06 | 1.10E-08 | 1.92E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.36E-08 | 1.06E-07 | 6.89E-08 | 2.10E-08 | -3.64E-07 |
| HTPNC | CTUh              | 1.95E-05 | 3.08E-07 | 9.83E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.46E-07 | 1.46E-06 | 3.17E-07 | 1.35E-07 | -2.17E-06 |
| SQP   | dimensionless     | 1.18E+03 | 4.82E+01 | 4.11E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.71E+00 | 2.26E+02 | 6.77E+01 | 1.25E+02 | -2.29E+02 |

## PARAMETERS DESCRIBING RESOURCE USE

|       |                         | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|-------|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PERE  | MJ, net calorific value | 7.87E+01 | 7.85E-01 | 5.82E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.59E-01 | 5.08E+00 | 9.06E+00 | 1.74E+00 | -1.43E+01 |
| PERM  | MJ, net calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PERT  | MJ, net calorific value | 7.87E+01 | 7.85E-01 | 5.82E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.59E-01 | 5.08E+00 | 9.06E+00 | 1.74E+00 | -1.43E+01 |
| PENRE | MJ, net calorific value | 2.12E+03 | 2.82E+01 | 1.47E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.38E+02 | 1.45E+02 | 8.82E+01 | 7.11E+01 | -1.86E+02 |
| PENRM | MJ, net calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PENRT | MJ, net calorific value | 2.12E+03 | 2.82E+01 | 1.47E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.38E+02 | 1.45E+02 | 8.82E+01 | 7.11E+01 | -1.86E+02 |
| SM    | kg                      | 1.81E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| RSF   | MJ, net calorific value | 2.24E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| NRSF  | MJ, net calorific value | 4.84E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| NFW   | m³                      | 2.43E+00 | 5.98E-03 | 1.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.99E-02 | 3.71E-02 | 4.71E-02 | 7.53E-02 | -7.09E-01 |

## OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

|      |    | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D        |
|------|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| HWD  | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NHWD | kg | 9.02E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RWD  | kg | 0        | 0        | 0        | 0        | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0        | 0        | 0        | 0        | 0        |

## ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

|     |    | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D        |
|-----|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| CRU | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MFR | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MER | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

## EXTRA INDICATORS

|       |                        | A1-A3    | A4       | A5       | B1        | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3        | C4        | D        |
|-------|------------------------|----------|----------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|----------|
| CC    | kg CO <sub>2</sub> eq. | 1.11E+02 | 0.00E+00 | 1.04E+00 | -1.50E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.69E+00 | -3.17E+00 | 0.00E+00 |
| CWRS  | kg CO <sub>2</sub> eq. | 2.23E-02 | 0.00E+00 | 2.23E-04 | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 |
| CWNRS | kg CO <sub>2</sub> eq. | 4.68E+00 | 0.00E+00 | 4.68E-02 | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 |

|                        |                                                                                      |
|------------------------|--------------------------------------------------------------------------------------|
| DECLARED UNIT          | 1m³                                                                                  |
| PRODUCT IDENTIFICATION | SprayMaster 40MPa 40% - Indicative Cement Reduction, GGBFS/Fly Ash/Silica Fume Blend |
| PRODUCTION SITE(S)     | Sydney                                                                               |
| COMPRESSIVE STRENGTH   | 40                                                                                   |
| DENSITY                | 2321.19 kg/m³                                                                        |
| REFERENCE SERVICE LIFE | 50 Years                                                                             |
| RECYCLING RATE AT EOL  | 82%                                                                                  |
| SCOPE                  | A1-A3 + A4-A5 + B1-B7 + C1-C4 + D, cradle-to-grave                                   |
| METHODOLOGY            | GCCA's Industry EPD Tool for Cement and Concrete (V3.0), International version       |
| REFERENCE YEAR         | 2021-01-10                                                                           |

## CORE ENVIRONMENTAL IMPACT INDICATORS

|         |                         | A1-A3    | A4       | A5        | B1        | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4        | D         |
|---------|-------------------------|----------|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|
| GWP-tot | kg CO <sub>2</sub> eq.  | 3.03E+02 | 1.64E+00 | 1.17E+01  | -1.68E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.99E+00 | 8.89E+00 | 4.59E+00 | -1.26E+00 | -1.46E+01 |
| GWP-fos | kg CO <sub>2</sub> eq.  | 3.03E+02 | 1.64E+00 | 1.17E+01  | -1.68E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.99E+00 | 8.88E+00 | 4.55E+00 | -1.26E+00 | -1.45E+01 |
| GWP-bio | kg CO <sub>2</sub> eq.  | 8.34E-02 | 6.43E-04 | 4.72E-03  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.60E-03 | 6.35E-03 | 1.99E-02 | 1.51E-03  | -5.84E-02 |
| GWP-luc | kg CO <sub>2</sub> eq.  | 6.17E-02 | 5.56E-04 | 3.64E-03  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.13E-03 | 5.16E-03 | 1.52E-02 | 1.23E-03  | -2.54E-02 |
| ODP     | kg CFC 11 eq.           | 9.65E-06 | 3.13E-07 | 1.33E-06  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.62E-06 | 1.49E-06 | 3.84E-07 | 7.47E-07  | -9.91E-07 |
| AP      | mol H <sup>+</sup> eq.  | 1.50E+00 | 8.50E-03 | 9.82E-02  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.42E-02 | 5.36E-02 | 4.07E-02 | 2.20E-02  | -1.03E-01 |
| EP-fw   | kg PO <sub>4</sub> eq.  | 1.95E-01 | 3.75E-04 | 7.30E-03  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.23E-03 | 3.64E-03 | 9.70E-03 | 8.24E-04  | -1.87E-02 |
| EP-fw*  | kg P eq.                | 1.95E-01 | 3.75E-04 | 7.30E-03  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.23E-03 | 3.64E-03 | 9.70E-03 | 8.24E-04  | -1.87E-02 |
| EP-mar  | kg N eq.                | 4.06E-03 | 1.06E-05 | 7.06E-04  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.34E-05 | 8.77E-05 | 2.19E-04 | 2.54E-05  | -3.94E-04 |
| EP-ter  | mol N eq.               | 3.09E+00 | 3.04E-02 | 3.47E-01  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.44E-01 | 1.89E-01 | 7.59E-02 | 7.87E-02  | -2.57E-01 |
| POCP    | kg NMVOC eq.            | 8.13E-01 | 9.17E-03 | 9.53E-02  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.22E-01 | 5.53E-02 | 2.14E-02 | 2.31E-02  | -6.50E-02 |
| ADPE    | kg Sb eq.               | 1.75E-04 | 3.07E-06 | 7.22E-06  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.66E-06 | 1.57E-05 | 4.73E-06 | 2.50E-06  | -1.66E-04 |
| ADPF    | MJ, net calorific value | 1.92E+03 | 2.53E+01 | 1.34E+02  | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.29E+02 | 1.28E+02 | 6.64E+01 | 6.29E+01  | -1.48E+02 |
| WDP     | m³ world eq. deprived   | 1.19E+02 | 1.91E-01 | -9.47E-01 | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.67E-01 | 1.15E+00 | 1.11E+00 | 3.08E+00  | -2.82E+01 |

## ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

|       |                   | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|-------|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PM    | Disease incidence | 1.01E-05 | 1.51E-07 | 1.71E-06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.45E-06 | 8.28E-07 | 3.64E-07 | 4.10E-07 | -1.21E-06 |
| IRP   | kBq U235 eq.      | 5.76E+03 | 1.36E+02 | 6.05E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.08E+02 | 7.59E+02 | 8.48E+02 | 2.95E+02 | -1.36E+03 |
| ETP   | CTUe              | 9.24E+01 | 5.46E+00 | 4.63E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.76E+00 | 2.32E+01 | 1.66E+00 | 1.20E+00 | -7.04E+00 |
| HTPC  | CTUh              | 1.10E-06 | 1.05E-08 | 1.92E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.36E-08 | 1.01E-07 | 6.57E-08 | 2.01E-08 | -3.47E-07 |
| HTPNC | CTUh              | 1.98E-05 | 2.94E-07 | 9.85E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.46E-07 | 1.39E-06 | 3.03E-07 | 1.28E-07 | -2.07E-06 |
| SQP   | dimensionless     | 1.23E+03 | 4.59E+01 | 4.13E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.71E+00 | 2.16E+02 | 6.46E+01 | 1.19E+02 | -2.18E+02 |

## PARAMETERS DESCRIBING RESOURCE USE

|       |                         | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|-------|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PERE  | MJ, net calorific value | 7.36E+01 | 7.49E-01 | 5.76E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.59E-01 | 4.84E+00 | 8.63E+00 | 1.66E+00 | -1.37E+01 |
| PERM  | MJ, net calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PERT  | MJ, net calorific value | 7.36E+01 | 7.49E-01 | 5.76E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.59E-01 | 4.84E+00 | 8.63E+00 | 1.66E+00 | -1.37E+01 |
| PENRE | MJ, net calorific value | 2.08E+03 | 2.69E+01 | 1.46E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.38E+02 | 1.38E+02 | 8.41E+01 | 6.78E+01 | -1.77E+02 |
| PENRM | MJ, net calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PENRT | MJ, net calorific value | 2.08E+03 | 2.69E+01 | 1.46E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.38E+02 | 1.38E+02 | 8.41E+01 | 6.78E+01 | -1.77E+02 |
| SM    | kg                      | 2.04E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| RSF   | MJ, net calorific value | 2.51E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| NRSF  | MJ, net calorific value | 5.42E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| NFW   | m³                      | 2.89E+00 | 5.71E-03 | 1.25E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.99E-02 | 3.54E-02 | 4.49E-02 | 7.18E-02 | -6.75E-01 |

## OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

|      |    | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D        |
|------|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| HWD  | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NHWD | kg | 9.02E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RWD  | kg | 0        | 0        | 0        | 0        | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0        | 0        | 0        | 0        | 0        |

## ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

|     |    | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D        |
|-----|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| CRU | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MFR | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MER | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

## EXTRA INDICATORS

|       |                        | A1-A3    | A4       | A5       | B1        | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3        | C4        | D        |
|-------|------------------------|----------|----------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|----------|
| CC    | kg CO <sub>2</sub> eq. | 1.24E+02 | 0.00E+00 | 1.17E+00 | -1.68E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.90E+00 | -3.55E+00 | 0.00E+00 |
| CWRS  | kg CO <sub>2</sub> eq. | 2.49E-02 | 0.00E+00 | 2.49E-04 | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 |
| CWNRS | kg CO <sub>2</sub> eq. | 5.24E+00 | 0.00E+00 | 5.24E-02 | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 |

|                                                                               |                                                                                                                                                                                                                                                                              |                                                                                     |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| EPD OWNER                                                                     | Hanson Construction Materials Pty Ltd<br>L10, 35 Clarence St, Sydney NSW 2000<br>Phone: 1300 136 464<br>Online: hanson.com.au                                                                                                                                                |  |
| PROGRAM OPERATOR                                                              | EPD Australasia Limited, 315a Hardy St, Nelson 7010 New Zealand<br>Online: epd-australasia.com<br>Email: info@epd-Australasia.com                                                                                                                                            |  |
| PROCESS EPD CERTIFIED BY                                                      | Katherine McFeaters<br><br>Epsten Group, Inc.<br>101 Marietta St. NW, Suite 2600, Atlanta, Georgia 30303, USA<br><a href="http://www.epstengroup.com">www.epstengroup.com</a><br>Accredited by: A2LA, Certificate #3142.03                                                   |  |
| PRODUCT CATEGORY RULES                                                        | CEN standard EN 15804:A2 (PCR 2019:14 Construction Products, Version 1.11) served as the core PCR.<br>Environdec c-PCR-003 Concrete, concrete elements (EN 16757:2017) served as sub-PCR.                                                                                    |                                                                                     |
| EN 15804 PCR REVIEW                                                           | The Technical Committee of the International EPD®System. Chair: Claudia A. Peña.<br>The review panel may be contacted via <a href="mailto:info@environdec.com">info@environdec.com</a> .                                                                                     |                                                                                     |
| EPD REGISTRATION NUMBER                                                       | S-P-03718                                                                                                                                                                                                                                                                    |                                                                                     |
| INDEPENDENT VERIFICATION OF THE DECLARATION AND DATA, ACCORDING TO ISO 14025: | <input checked="" type="checkbox"/> EPD process certification<br><input type="checkbox"/> EPD verification                                                                                                                                                                   |                                                                                     |
| VALID FROM                                                                    | 2021-09-08                                                                                                                                                                                                                                                                   |                                                                                     |
| VALID TO                                                                      | 2026-09-08                                                                                                                                                                                                                                                                   |                                                                                     |
| VERSION                                                                       | 1.1 - 2022-02-15                                                                                                                                                                                                                                                             |                                                                                     |
| DESCRIPTION OF VERSION DIFFERENCES (IF NOT VERSION 1.0)                       | Updated with carbonation values                                                                                                                                                                                                                                              |                                                                                     |
| GEOGRAPHICAL SCOPE                                                            | Sydney, NSW                                                                                                                                                                                                                                                                  |                                                                                     |
| IMPORTANT NOTES                                                               | EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.<br><br>The EPD Owner maintains full ownership, liability and responsibility for the EPD. |                                                                                     |
| PRODUCT GROUP CLASSIFICATION                                                  | UN CPC 88 - Concrete, cement and plaster article manufacturing services                                                                                                                                                                                                      |                                                                                     |
| ANZSIC CLASSIFICATION                                                         | 2033 Ready Mix Concrete Manufacturing                                                                                                                                                                                                                                        |                                                                                     |

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