



# NEILSENS CONCRETE

## Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

### Premixed Concrete - N40 20mm 100mm slump

*EPD of a single product, based on the volume weighted average results of multiple sites. An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at <http://www.environdec.com>.*

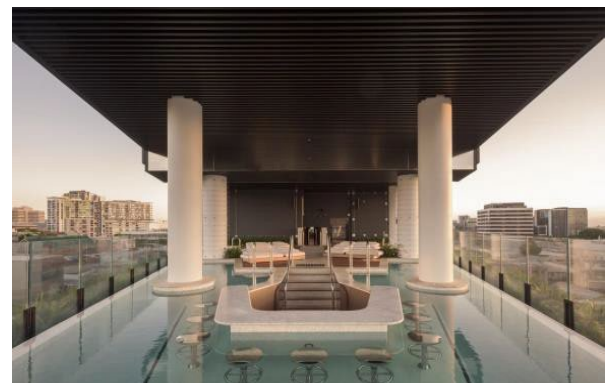
|                          |                                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programme:               | The International EPD® System<br><a href="http://www.environdec.com">www.environdec.com</a>  | <br>THE INTERNATIONAL EPD® SYSTEM<br><br>AUSTRALASIA<br>INTERNATIONAL EPD SYSTEM<br> |
| Programme operator:      | EPD International AB<br><a href="http://www.epd-australasia.com">www.epd-australasia.com</a> |                                                                                                                                                                                                                                                                                                                                                    |
| Regional Programme:      | EPD Australasia                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
| EPD registration number: | EPD-IES-0023077:001                                                                          |                                                                                                                                                                                                                                                                                                                                                    |
| Publication date:        | 2025-06-13                                                                                   |                                                                                                                                                                                                                                                                                                                                                    |
| Valid until:             | 2030-06-13                                                                                   |                                                                                                                                                                                                                                                                                                                                                    |
| Geographical Scope:      | Queensland                                                                                   |                                                                                                                                                                                                                                                                                                                                                    |





## Table of Contents

|                                                           |    |
|-----------------------------------------------------------|----|
| Programme information and verification.....               | 3  |
| Company information.....                                  | 4  |
| Product information .....                                 | 5  |
| LCA information .....                                     | 6  |
| Product description and use.....                          | 9  |
| Results of the environmental performance indicators ..... | 11 |
| References.....                                           | 14 |



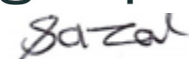


## Programme information and verification

|                              |                                                                                                                                                                                                                                                               |                                                                                                                                                          |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPD Owner                    | Neilsens Concrete Pty Ltd<br>Johnstone Rd, Brendale Q 4500<br>Web: <a href="http://www.neilsens.com.au">www.neilsens.com.au</a><br>Phone: +61 7 3205 5599                                                                                                     |  <b>THE NEILSEN GROUP</b><br>THE INDEPENDENT ALTERNATIVE™             |
| EPD Programme Operator       | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden<br>Email: <a href="mailto:info@environdec.com">info@environdec.com</a>                                                                                                                    |  <b>EPD</b> <sup>®</sup><br>THE INTERNATIONAL EPD <sup>®</sup> SYSTEM |
| Regional Programme           | EPD Australasia Limited<br>315a Hardy Street Nelson 7010, New Zealand<br>Web: <a href="http://www.epd-australasia.com">www.epd-australasia.com</a><br>Email: <a href="mailto:info@epd-australasia.com">info@epd-australasia.com</a><br>Phone: +61 2 8005 8206 |  <b>EPD</b> <sup>®</sup><br>INTERNATIONAL EPD SYSTEM                  |
| EPD Produced by              | Jason Chandler<br>Chandler Concrete Consulting Pty Ltd<br>Trading as Concrete Insights<br>42 Bingara Rd<br>Beecroft NSW 2119<br>Web: <a href="http://www.concreteinsights.com.au">www.concreteinsights.com.au</a><br>Phone: +61 401 895950                    |  <b>Concrete Insights</b>                                             |
| EPD Registration number      | EPD-IES-0023077:001                                                                                                                                                                                                                                           |                                                                                                                                                          |
| Date of Publication          | 2025-06-13                                                                                                                                                                                                                                                    |                                                                                                                                                          |
| Revision number              | 1                                                                                                                                                                                                                                                             |                                                                                                                                                          |
| Valid until                  | 2030-06-13                                                                                                                                                                                                                                                    |                                                                                                                                                          |
| Product group classification | UN CPC 375 (Articles of concrete, cement and plaster)                                                                                                                                                                                                         |                                                                                                                                                          |
| Geographical Scope           | Queensland, Australia                                                                                                                                                                                                                                         |                                                                                                                                                          |
| Reference Year for Data      | 01-04-2023 to 31-03-24                                                                                                                                                                                                                                        |                                                                                                                                                          |

CEN standard EN 15804:2012+A2:2019/AC:2021 served as the core Product Category Rules (PCR)

|                                                                                                |                                                                                                                                                                                                                                                                                                                                                        |  |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Product category rules                                                                         | PCR 2019:14 Construction Products, Version 1.3.4, 2024-04-30<br>c-PCR-003 Concrete and Concrete Elements, 2024-04-30                                                                                                                                                                                                                                   |  |
| PCR review was conducted by                                                                    | The Technical Committee of the International EPD System. See <a href="http://www.environdec.com">www.environdec.com</a> for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a>        |  |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006: | <input checked="" type="checkbox"/> EPD verification by individual verifier<br>Third Party Verifier:<br>Sazal Kundu<br>Edge Environment Pty Ltd<br>Level 3, Greenhouse, 180 George Street, Sydney NSW 2000 Australia<br>Web: <a href="http://www.edgeimpact.global">www.edgeimpact.global</a> Phone: +61 2 9438 0100.<br>Approved by: EPD Australasia® |  |
| Procedure for follow-up of data during EPD validity involves third party verifier:             | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                                                                                                                                                                                                                                                                    |  |

 **edge impact**<sup>™</sup>  


The EPD owner has the sole ownership, liability, and responsibility for the EPD.

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



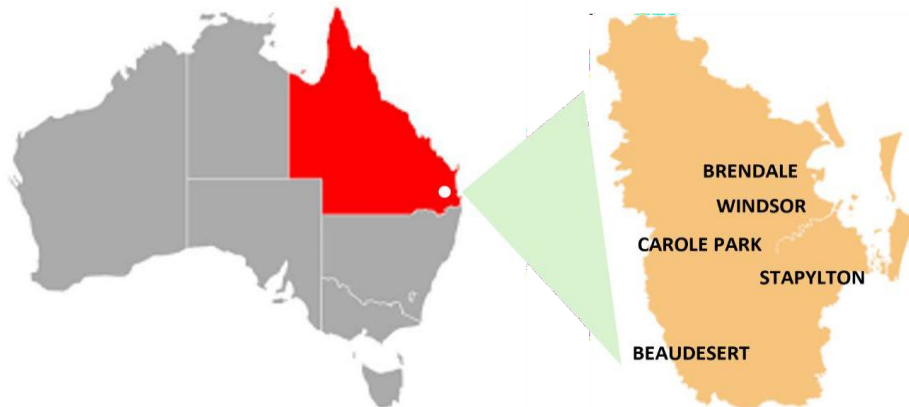
## Company information

The Neilsens Group is a wholly owned, independent family business operating in the Greater Brisbane region and is one of the largest independently owned concrete and quarry operations based in Queensland. Its core business is the manufacture and supply of construction materials: pre-mixed concrete, concrete aggregate and general quarry products, cement and fly ash; and associated transport logistics and technical services.

The quarry operations commenced at Brendale QLD in 1976 as Neilsens Quality Gravels Pty Ltd. The pre-mixed concrete operations commenced at Brendale QLD in 1993 as Neilsens Concrete Pty Ltd.

Neilsens Quality Gravels operates from three quarry sites: Brendale north of Brisbane, and Beaudesert and Bromelton both located in the Scenic Rim. An additional quarry is in development at Warrell View in the Scenic Rim.

Neilsens Concrete Pty Ltd operates from five sites: Brendale, Windsor, Carole Park, Stapylton, and Beaudesert. An additional site is in development at Coorparoo.



Neilsens Technical Services operates a construction materials testing laboratory at Carole Park that has maintained continuous NATA Accreditation since 1998.

Neilsens is committed to the quality and reliability of its products and services. It begins when our customer first contacts Neilsens, and achieved through the skills and knowledge of our sales, dispatch, transport, administration, and technical teams.

Neilsens interacts with the general public, both as customers and in community, and with builders, contractors, professional consultants, and industry regulators. Our product knowledge, our experience, our service skills, and our regulatory compliance are the criteria by which we are judged.

Owner of the EPD:

Contact:

Description of the organisation:

Product-related or management system-related certifications:

Name and location of production site(s):

Neilsens Concrete Pty Ltd

Ph: 1300 266 273  
<https://neilsens.com.au/contact-us/>

Pre Mixed Concrete Supplier

ISO 9001:2015 Accredited  
(certificate FS 520402)

Brendale, Windsor, Carole  
Park, Stapylton, Beaudesert,

## Product information

Product name:

40MPa Premixed Concrete (or ready-mixed concrete)

Product manufacturing process:

Concrete is a construction material composed of primary and secondary cementitious materials, water, fine aggregates, coarse aggregates and performance enhancing admixtures. Premixed concrete is produced in concrete batching plants whereby bulk quantities of all constituents in a concrete mix are stored and then blended together in defined proportions to produce the desired concrete properties. Neilsens operate 'dry batch' concrete plants at each of the five locations covered by the EPD. Dry batching refers to the process by which all constituent ingredients in a concrete mix are added together 'dry' in the back of a concrete agitator truck in which they are mixed with water to produce the wet or 'plastic' concrete that is then transported to construction job sites in the same mixing vehicle before being discharged from the vehicle for placement on the customer's site.

Product description:

Australian Standard AS1379 Specification and supply of concrete informs the requirements for specifying concrete, and for concrete production and supply. The Standard classifies concrete into two classes: Normal and Special Class. Within Special Class there is provision for Special Class – Prescription concrete. Neilsens Concrete supplies both Normal Class and Special Class concrete to this Standard.

Normal class concrete is used broadly across all sectors of construction. It is specified and supplied based on six basic parameters: compressive strength, aggregate type and nominal size, workability, method of placement, and air content.

Special class concrete is any concrete, other than Normal class, where additional parameters are specified, for specific performance and/or prescribed content, to meet end use requirements.

Normal and Special Class concrete comprises mixtures of primary cementitious material Cement; and secondary cementitious materials [SCMs]: Classified Flyash and Ground Granulated Blast Furnace Slag; Aggregates; Water; and Chemical Admixtures.

UN CPC code: 375 (Articles of concrete, cement and plaster)

CPV code: 44114000-3 [Ready-mixed concrete]

ANZSIC code: 20330 (Concrete – ready mixed – except dry mix)

Geographical scope: Queensland





## LCA information

|                                    |                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Declared unit:                     | 1 m <sup>3</sup> or pre-mixed concrete                                                                                                                                                                                                                                                                                                                      |
| Time representativeness:           | The plant data for the LCA is based on the 12 months 1 <sup>st</sup> April 2023 to 31 <sup>st</sup> March 2024 inclusive.                                                                                                                                                                                                                                   |
| Database(s) and LCA software used: | GCCA Industry EPD Tool for Cement and Concrete (V5.0), International version. The life cycle inventory database used in the tool is the ecoinvent database (v3.10), cut-off system model. The ecoinvent LCI database is the most widely used LCI database worldwide and the reference database for a large number of EPDs and sector-specific LCI datasets. |

### Basis of EPD data

This EPD is a generic geographic multi-site, single product EPD covering Neilsens' five concrete batching plants in south east Queensland. Individual product volumes vary between plants, the values for this product were assigned based on the volume weighted average of total production of each site.

The products covered by this EPD are manufactured, used, and disposed of in Queensland, Australia. Several raw materials are sourced internationally.

### Cut off criteria

In accordance with the PCR 2019:14, the following system boundaries are applied to manufacturing equipment and employees:

- Environmental impact from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process are not accounted for in this LCI. Capital equipment and buildings typically account for less than a few percent of nearly all LCIs and this is usually smaller than the error in the inventory data itself. For this project it is assumed that the capital equipment makes a negligible contribution to the impacts as per Frischknecht et al. (2007) with no further investigation.
- Personnel related impacts, for example transportation to and from work, are also not accounted for in this LCI. The impacts of employees are also excluded from the inventory impacts on the basis that if they were not employed for this production or service function, they would be employed for another. It is very difficult to determine what proportion of the impacts from their whole lives should count toward their employment. For this project, the impact of employees are excluded.

Based on this guidance, no energy or mass flows, except packaging of materials were excluded. All materials required for manufacturing are delivered via trucks and ships without packaging.

### Allocations

- No co-products are generated during clinker and cement production, eliminating the need for allocation in by-products.
- This concrete is delivered to site immediately after its production. No packaging is used for its raw materials nor in this distribution of the final product and therefore there are no packaging materials requiring end-of-life treatment and thus no co-product allocation is required.

### Data Quality

Foreground data on raw material requirements, manufacture and distribution was provided as primary source by Neilsens Concrete for the year 1<sup>st</sup> April 2023 – 31<sup>st</sup> March 2024. Schemes for data quality assessment of generic and specific data from EN 15804+A2 (table E.1) are used to perform this data quality assessment activity, as shown in the following Table 1.



Table 1 – Data quality by module

| Module | Life Cycle Stage                                     | Data Source and LCA Factor                                                                    | Year                                                    | Data Quality |
|--------|------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------|
| A1     | Raw Material – Cement                                | Published EPD, supplier mix design                                                            | EPD 2023, mix design supplied by Neilsens Concrete 2024 | Very good    |
|        | Raw Materials – Supplementary cementitious materials | Ecoinvent, supplier mix design                                                                | 2024                                                    | Good         |
|        | Raw Materials – Aggregates                           | Ecoinvent, supplier mix design                                                                | 2024                                                    | Good         |
|        | Raw Materials – Admixtures                           | Ecoinvent, supplier mix design                                                                | 2024                                                    | Good         |
| A2     | Raw material transport from suppliers                | Actual distances from source to manufacturing site, GCCA default factors                      | 2024                                                    | Good         |
| A3     | Manufacturing                                        | Actual metered energy and water inputs. Estimated waste outputs. Annual production volumes    | 2024                                                    | Very Good    |
| A4     | Transport to site                                    | Actual concrete truck fuel usage and distance travelled. GCCA default factors for truck type. | 2024                                                    | Good         |
| A5     | Construction                                         | Default scenario, Ecoinvent                                                                   | Estimate using Ecoinvent factors                        | Fair         |
| C1     | Deconstruction and demolition                        | Default scenario, Ecoinvent                                                                   | Estimate using Ecoinvent factors                        | Fair         |
| C2     | Transport to waste processing                        | Default scenario, Ecoinvent                                                                   | Estimate using Ecoinvent factors                        | Fair         |
| C3     | Waste processing                                     | Default scenario, Ecoinvent                                                                   | Estimate using Ecoinvent factors                        | Fair         |
| C4     | Disposal                                             | Default scenario, Ecoinvent                                                                   | Estimate using Ecoinvent factors                        | Fair         |
| D      | Reuse-Recovery-Recycling- potential                  | Default scenario, Ecoinvent                                                                   | Estimate using Ecoinvent factors                        | Fair         |

Assumptions:

- The GCCA Industry EPD Tool for Cement and Concrete (V5.0), International version uses global characterisation factors for Water Deprivation Potential (WDP) and does not use regionalized Australian catchment level data.
- Values for Module C are determined from predefined values within the GCCA tool, including use of default values for construction materials recycling of 81%. The results of modules A1-A3 should be assessed in conjunction with the results of module C.
- In the GCCA tool direct (foreground) infrastructure is excluded, as it is commonly accepted to contribute negligibly to the environmental footprint of clinker, cement, aggregates, concrete and precast. The (background) infrastructure is, however, included by default in the Ecoinvent 3.10 database used in the model.
- As this is a multi-site single product EPD it is assumed that the relative total volume of each product produced by each batching plant is proportional to the total plant volumes.
- The energy balancing as per PCR 2019:14 Construction Products v1.3.4 is performed according to Option B (see Annex 3 of the PCR).
- Fly ash is a supplementary cementitious material derived from burning of coal in electricity production and used as a raw material in the product. It is considered to carry no environmental impact for the purposes of this EPD, hence an economic allocation of \$0 has been applied. The transport of flyash to concrete batching sites has been taken into account when carrying out the LCA
- Blast furnace slag is a by-product of steel production that is dried and ground for use in concrete production as a supplementary cementitious material. Slag imported into Brisbane is assumed sourced from Japan. The Japanese Economic allocation from LCI Cement and Concrete Life

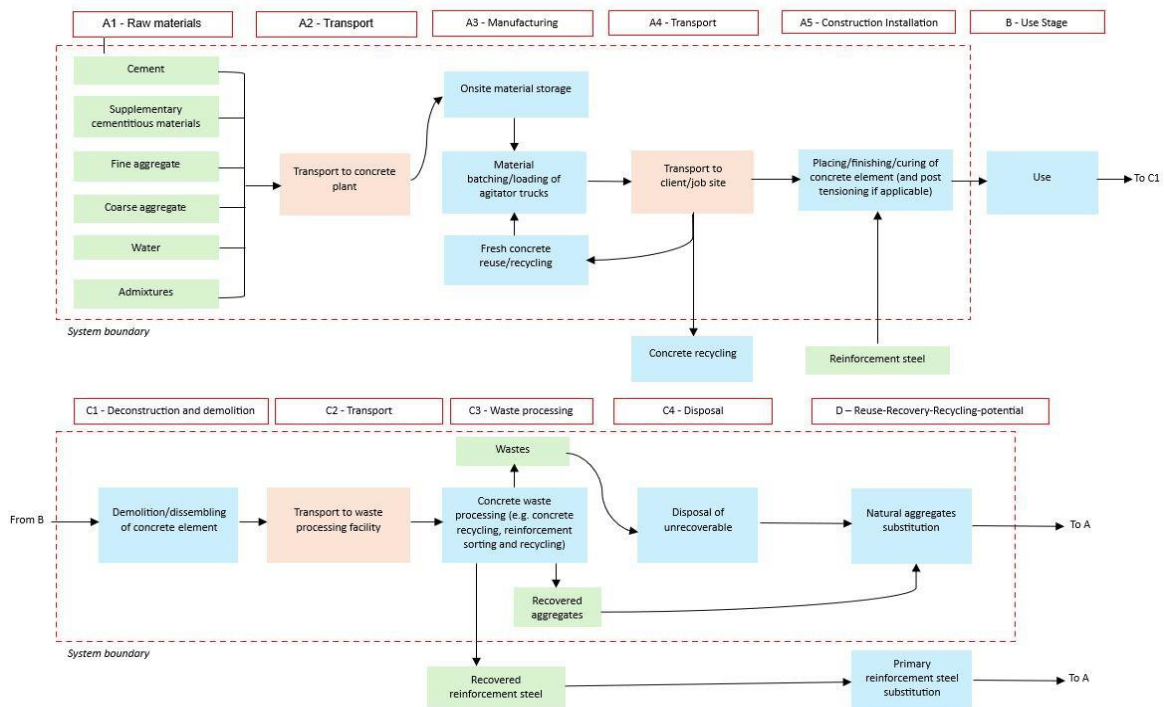


Cycle Strategies (2015) is 0.318%. 1% is used in this case as a conservative allocation figure.

#### Description of system boundaries:

The EPD covers the life cycle of Neilsens ready-mixed concrete from cradle to grave (modules A1-A3, A4-A5, C1-C4 & D), excluding module B (use stage). Refer to the system diagram and modules declared below:

#### System diagram:



**Table 2 - Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results)**

|                      | Product stage       |           |               | Construction process stage |                           | Use stage |             |        |             |               |                        |                       | End of life stage          |           |                  |          | Resource recovery stage            |
|----------------------|---------------------|-----------|---------------|----------------------------|---------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|------------------------------------|
|                      | Raw material supply | Transport | Manufacturing | Transport                  | Construction installation | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| Module               | A1                  | A2        | A3            | A4                         | A5                        | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2        | C3               | C4       | D                                  |
| Modules declared     | X                   | X         | X             | X                          | X                         | ND        | ND          | ND     | ND          | ND            | ND                     | ND                    | X                          | X         | X                | X        | X                                  |
| Geography            | GLO                 | GLO       | AU            | AU                         | AU                        | -         | -           | -      | -           | -             | -                      | -                     | AU                         | AU        | AU               | AU       | AU                                 |
| Specific data used   | >90%                |           |               |                            |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                  |
| Variation – products | 0%                  |           |               |                            |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                  |
| Variation – sites    | +3%/-3%             |           |               |                            |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                  |

Note - It is discouraged to use the results of modules A1-A3 without taking into consideration the results of module C.

## Product description and use

*Table 3 – Product information*

| Strength Grade | Mix Code | Mix Description      | Applications    |
|----------------|----------|----------------------|-----------------|
| N40            | N402100  | N40 20mm 100mm slump | General purpose |

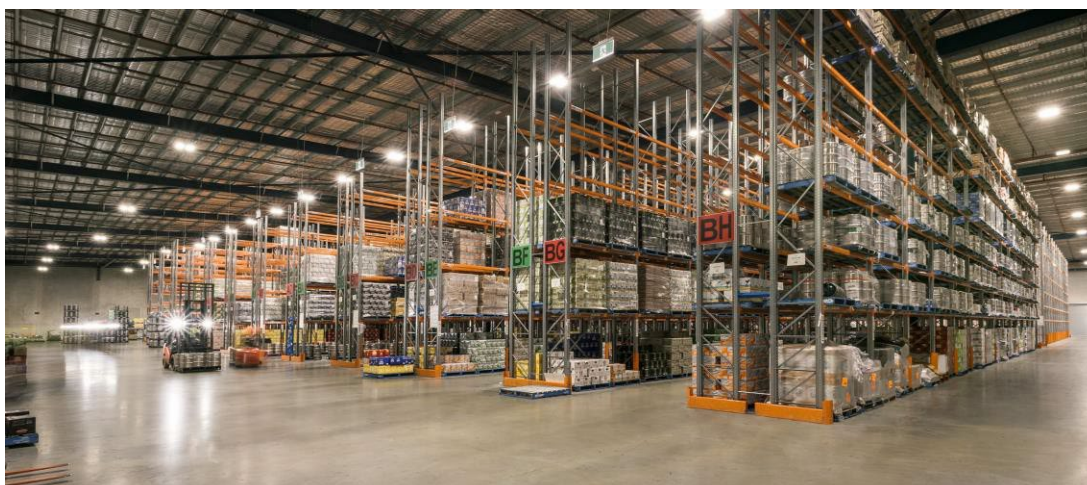
The table below provides estimated contributions of materials used in the range of Normal class concrete produced by Neilsens Concrete.

The gross weighted average of this declared material, 2350 kg per cubic metre, makes up a minimum of 99% of the products covered by this EPD. The following table provides a summary of the materials included in Neilsens Concrete ready-mix concrete and the relative composition by weight.

Ready-mix concrete is classified as Non-Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. None of the products contain one or more substances that are listed in the “Candidate List of Substances of Very High Concern for authorisation”.

*Table 4 – Content declaration of the product*

| Product components              | % by weight | Post-consumer material, weight % of product | Biogenic material, weight % of product | Biogenic material, weight - kg C/m <sup>3</sup> |
|---------------------------------|-------------|---------------------------------------------|----------------------------------------|-------------------------------------------------|
| GP Cement                       | 5-20        | 0                                           | 0                                      | 0                                               |
| Secondary Cementitious Material | 0-15        | 0                                           | 0                                      | 0                                               |
| Aggregates                      | 65-85       | 0                                           | 0                                      | 0                                               |
| Water                           | 7-12        | 0                                           | 0                                      | 0                                               |
| Admixtures                      | 0-1         | 0                                           | 0                                      | 0                                               |
| <b>SUM</b>                      | <b>100</b>  | <b>0</b>                                    | <b>0</b>                               | <b>0</b>                                        |





#### Cradle to Gate (Modules A1-A3)

Raw materials used in production of Neilsens' premix concrete covered by this EPD include cement, supplementary cementitious materials, aggregates, admixtures and water. These materials are transported to the batching plant from their place of manufacture by road, rail and sea and stored in silos, hoppers, ground bins or tanks. During the batching process they are conveyed to a batching hopper where they are weighed and discharged into a concrete agitator truck and mixed together to form a heterogeneous concrete mixture.

The impact of electricity usage at concrete batching plants was calculated based on metered values during the reference period. Electricity mix sourced from Table O4.2, "Electricity generation in Queensland, by fuel type, physical units, calendar year" (Calendar Year 2023-QLD), <https://www.energy.gov.au/publications/australian-energy-statistics-table-o-electricity-generation-fuel-type-2022-23-and-2023>.

As the composition of the residual grid mix on the market has not been publicly disclosed, it has been conservatively estimated by subtracting renewables from the consumption mix of the market. The breakdown of supply is thus - Coal + Peat (79.23%), Oil (2.26%), Gas (16.38%), Biomass (2.13%).

The impact of this electricity on the GWP-GHG of modules A1-A3 is 1.08kg CO<sub>2</sub> eq. per kWh.

#### Gate to Site (Module A4)

The GCCA tool utilises a default truck emission standard of Euro 4 for Oceania. An assumed average load size of 4.5m<sup>3</sup> in a 6.0m<sup>3</sup> capacity was used as a conservative figure estimating that not all delivery loads would be full and nor would all back loads be empty. Fuel consumption and distance travelled data is as per recorded by Neilsens Concrete during the period.

Table 5 – Truck transport Content declaration of the product

| Vehicle      | Fuel consumption (l/km) | Fuel type | Average distance travelled (km) | Density of products (kg/m <sup>3</sup> ) | Average load factor | Volume capacity utilisation factor |
|--------------|-------------------------|-----------|---------------------------------|------------------------------------------|---------------------|------------------------------------|
| Euro 4 truck | 0.43                    | Diesel    | 13.98                           | 2350                                     | 37.5%               | <1                                 |

#### Construction (Module A5)

As Neilsens does not have operational control over the placement of ready-mix concrete at the construction site assumptions for construction inputs and waste are made based on the GCCA tool default values. These values cover pumping, placing and finishing of concrete but do not include pre-installation activities such as form work and steel placing.

Table 6 – Construction site default values from GCCA tool

| Construction inputs and waste | Value | Unit of measure |
|-------------------------------|-------|-----------------|
| Concrete losses               | 3     | %               |
| Electricity                   | 2.776 | kWh             |
| Diesel, in building machine   | 1.669 | l               |
| Water                         | 669   | kg              |
| Wastewater                    | 0.669 | m <sup>3</sup>  |

#### End-of-life (Modules C1-C4)

Concrete manufacturers such as Neilsen Concrete have no control over the end-of-life use of their product. At the end of its use stage, concrete products are demolished, crushed and either sent to landfill or recycled.

All other values associated with demolition, transport, waste processing and disposal are fixed default values based on ecoinvent 3.10 database which in turn is specifically found at:



C1 – Deconstruction/demolition: The energy for dismantling and handling from the waste management dataset “*Treatment of waste concrete, not reinforced, sorting plant, GLO*”. This assigns a value for the use of diesel fuel in this stage of 96.1MJ per cubic metre of concrete. 100% of the product (2350kg) is assumed to be separately collected during deconstruction.

C2 – Transport after demolition: The transportation means of concrete waste flows at the end-of-life are derived from ecoinvent 3.10 dataset “*Market for waste concrete, GLO*”. The transportation distance considered comes from the JRC Technical Report, Model for Life Cycle Assessment (LCA) of buildings, 2018, Section 6.1.4, Table 20 and the transportation modelling is described in section 3.1.4. The default distance to landfill or processing facility is set at 50km and transport mode split between train and truck.

C3 – Waste processing: The life-cycle inventory for the processing of concrete waste to be recycled is based on the values provided in ecoinvent 3.10 for “Dry sorting plant for building wastes with pre-sorting of mixed waste, crushing and manual sorting”, from dataset *Treatment of waste concrete, not reinforced, sorting plant, GLO*. Those values are weighted by the recycling rate. In the GCCA tool, the recycling rate is a region-specific rate manually entered by the LCA producer. That value of 81% is sourced from DCCEEW 2024 data.

C4 – Disposal: The remaining waste concrete undergoes inert waste landfill.

During its life, chemicals within the concrete react with carbon dioxide in the atmosphere in a process known as carbonation, often referred to as ‘recarbonation’ in the context of concrete Life Cycle Analysis. As concrete is demolished, the exposed surface area of concrete particles increases and so does the rate of this carbonation reaction. The actual amount of carbonation is impacted by the exposed surface area, temperature and humidity and thus an exact figure is impossible to ascertain and default values from GCCA Tool are used in this EPD.

#### Benefits and Loads Beyond the System Boundary (Module D)

The impacts beyond the system boundaries are calculated, for each flow of recycled material, as the difference between the impacts of recycling 1 kg of material and the impacts of 1 kg of the primary materials avoided, multiplied by the mass flow sent to recycling minus its initial recycled material content.

Only concrete is taken into consideration when calculating benefits and loads beyond the system boundaries. Other materials are excluded as there is no recycling.

## Results of the environmental performance indicators

EN 15804 reference package based on EF 3.1 (Environmental Footprint) or a later version has been used. The environmental impacts considered in this EPD, along with their description, unit of measure and calculated values are shown in Tables 7a-e below. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

**Table 7a - Core environmental impact indicators**

| Indicator  | Unit                              | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4        | D         |
|------------|-----------------------------------|----------|----------|----------|----------|----------|----------|-----------|-----------|
| GWP-GHG ** | kg CO <sub>2</sub> eq.            | 2.71E+02 | 7.94E-01 | 1.75E+01 | 9.64E+00 | 1.03E+01 | 4.00E+00 | -9.78E-01 | -1.39E+01 |
| GWP-tot *  | kg CO <sub>2</sub> eq.            | 2.71E+02 | 7.94E-01 | 1.75E+01 | 9.64E+00 | 1.03E+01 | 4.00E+00 | -9.78E-01 | -1.39E+01 |
| GWP-fos    | kg CO <sub>2</sub> eq.            | 2.71E+02 | 7.94E-01 | 1.75E+01 | 9.63E+00 | 1.03E+01 | 3.98E+00 | -9.81E-01 | -1.39E+01 |
| GWP-bio    | kg CO <sub>2</sub> eq.            | 1.75E-01 | 3.26E-05 | 7.67E-03 | 1.05E-03 | 2.20E-03 | 6.87E-03 | 3.89E-04  | -3.46E-02 |
| GWP-luc    | kg CO <sub>2</sub> eq.            | 4.67E-02 | 3.22E-04 | 4.04E-03 | 8.36E-04 | 4.94E-03 | 7.21E-03 | 1.45E-03  | -1.09E-02 |
| ODP        | kg CFC 11 eq.                     | 3.34E-06 | 1.24E-08 | 3.03E-07 | 1.47E-07 | 1.49E-07 | 4.49E-08 | 8.15E-08  | -1.13E-07 |
| AP         | mol H <sup>+</sup> eq.            | 1.19E+00 | 3.30E-03 | 1.18E-01 | 8.69E-02 | 5.35E-02 | 3.25E-02 | 2.00E-02  | -8.75E-02 |
| EP-fw      | kg P eq.                          | 4.38E-02 | 2.04E-05 | 1.78E-03 | 9.17E-05 | 3.45E-04 | 7.96E-04 | 7.63E-05  | -1.25E-03 |
| EP-mar     | kg N eq.                          | 6.69E-02 | 1.20E-03 | 3.24E-02 | 4.03E-02 | 2.00E-02 | 7.51E-03 | 7.61E-03  | -2.08E-02 |
| EP-ter     | mol N eq.                         | 2.51E+00 | 1.31E-02 | 4.01E-01 | 4.41E-01 | 2.18E-01 | 7.80E-02 | 8.31E-02  | -2.63E-01 |
| POCP       | kg NMVOC eq.                      | 6.77E-01 | 4.80E-03 | 1.18E-01 | 1.32E-01 | 7.30E-02 | 2.33E-02 | 2.97E-02  | -7.11E-02 |
| ADPE ***   | kg Sb eq.                         | 2.95E-04 | 2.23E-06 | 2.79E-05 | 3.53E-06 | 2.82E-05 | 3.09E-05 | 4.49E-06  | -7.34E-05 |
| ADPF ***   | MJ, net calorific value           | 1.61E+03 | 1.16E+01 | 1.72E+02 | 1.26E+02 | 1.45E+02 | 7.59E+01 | 6.91E+01  | -1.66E+02 |
| WDP ***    | m <sup>3</sup> world eq. deprived | 5.02E+01 | 5.56E-02 | 2.25E+00 | 3.09E-01 | 8.47E-01 | 1.21E+00 | 1.93E-01  | -2.78E+01 |



\* The indicated values (gross values) include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The net GWP-tot (excluding the emissions from the incineration of secondary fuels at clinker production) is 2.71E2 kg CO<sub>2</sub>-eq. The net GWP-fos is 2.71E2 kg CO<sub>2</sub>-eq. The net GWP-bio is 1.75E-1 kg CO<sub>2</sub>-eq. This information was sourced from the GCCA tool.

\*\* The indicated values (gross values) include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The net GWP-GHG (excluding the emissions from the incineration of secondary fuels at clinker production) is 2.71E2 kg CO<sub>2</sub>-eq. This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO<sub>2</sub> is set to zero. This information was sourced from the GCCA tool.

\*\*\* The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high, or there is limited experience with the indicator.

It should be noted that the net/gross differentiation applies to GWP indicators only and is ignored for other indicators where gross is applied by default.

Core environmental impact indicators • **GWP-GHG** (Global Warming Potential, GHG) • **GWP-tot** (Global Warming Potential, total) • **GWP-fos** (Global Warming Potential, fossil fuels) • **GWP-bio** (Global Warming Potential, biogenic) • **GWP-luc** (Global Warming Potential, land use and land use change) • **ODP** (Depletion potential of the stratospheric ozone layer) • **AP** (Acidification potential, Accumulated Exceedance) • **EP-fw** (Eutrophication potential, fraction of nutrients reaching freshwater end compartment) • **EP-mar** (Eutrophication potential, fraction of nutrients reaching marine end compartment) • **EP-ter** (Eutrophication potential, Accumulated Exceedance) • **POCP** (Formation potential of tropospheric ozone) • **ADPE** (Abiotic depletion potential for non-fossil resources) • **ADPF** (Abiotic depletion potential for fossil resources potential) • **WDP** (Water (user) deprivation potential, deprivation-weighted water consumption)

**Table 7b - Additional environmental impact indicators**

| Indicator | Unit              | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-----------|-------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PM        | Disease incidence | 8.88E-06 | 8.12E-08 | 1.95E-06 | 2.47E-06 | 1.13E-06 | 3.77E-07 | 4.54E-07 | -1.42E-06 |
| IRP *     | kBq U235 eq.      | 1.60E+03 | 1.02E-02 | 4.80E+01 | 5.65E-02 | 1.87E-01 | 7.24E-01 | 4.40E-02 | -1.19E+00 |
| ETP **    | CTUe              | 2.26E+02 | 2.79E+00 | 1.74E+02 | 1.79E+01 | 4.18E+01 | 1.87E+01 | 9.44E+00 | -8.87E+01 |
| HTPC **   | CTUh              | 7.40E-07 | 3.97E-09 | 6.35E-08 | 3.77E-08 | 6.60E-08 | 1.46E-08 | 1.27E-08 | -1.64E-07 |
| HTPNC **  | CTUh              | 1.19E-05 | 7.67E-09 | 4.14E-07 | 1.72E-08 | 9.30E-08 | 5.29E-08 | 1.24E-08 | -1.12E-07 |
| SQP **    | dimensionless     | 1.36E+03 | 1.17E+01 | 6.88E+01 | 8.86E+00 | 1.35E+02 | 4.14E+01 | 1.36E+02 | -1.77E+02 |

\* This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

\*\* The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

Additional environmental impact indicators • **PM** (Potential incidence of disease due to PM emissions) • **IRP** (Potential Human exposure efficiency relative to U235) • **ETP** (Potential Comparative Toxic Unit for ecosystems) • **HTPC** (Potential Comparative Toxic Unit for humans - cancer) • **HTPNC** (Potential Comparative Toxic Unit for humans - non-cancer) • **SQP** (Potential soil quality index)

**Table 7c - Parameters describing resource use**

| Indicator | Unit                    | A1-A3    | A4       | A5       | C1       | C2       | C3        | C4       | D         |
|-----------|-------------------------|----------|----------|----------|----------|----------|-----------|----------|-----------|
| PERE      | MJ, net calorific value | 3.05E+01 | 1.53E-01 | 6.27E+00 | 7.73E-01 | 2.83E+00 | 9.65E+00  | 6.41E-01 | -1.38E+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  |
| PERT      | MJ, net calorific value | 3.05E+01 | 1.53E-01 | 6.27E+00 | 7.73E-01 | 2.83E+00 | 9.65E+00  | 6.41E-01 | -1.38E+01 |
| PENRE     | MJ, net calorific value | 1.61E+03 | 1.16E+01 | 1.72E+02 | 1.26E+02 | 1.45E+02 | 7.59E+01  | 6.91E+01 | -1.66E+02 |
| PENRM     | MJ, net calorific value | 1.74E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.41E+00 | 0.00E+00 | 0.00E+00  |
| PENRT     | MJ, net calorific value | 1.61E+03 | 1.16E+01 | 1.72E+02 | 1.26E+02 | 1.45E+02 | 7.59E+01  | 6.91E+01 | -1.66E+02 |
| SM        | kg                      | 1.16E+02 | 0.00E+00 | 3.48E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00 | 0.00E+00  |
| RSF       | 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  |
| NRSF      | 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  |
| NFW       | m³                      | 1.56E+00 | 1.71E-03 | 6.40E-02 | 8.19E-03 | 2.42E-02 | 3.45E-02  | 7.16E-02 | -6.58E-01 |

Parameters describing resource use • **PERE** (Use of renewable primary energy excluding renewable primary energy resources used as raw materials) • **PENRE** (Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials) • **SM** (Use of secondary materials) • **RSF** (Use of renewable secondary fuels) • **NRSF** (Use of non-renewable secondary fuels) • **PERM** (Use of renewable primary energy resources used as raw materials) • **PERT** (Total use of renewable primary energy resources) • **PENRM** (Use of non-renewable primary energy resources used as raw materials) • **PENRT** (Total use of non-renewable primary energy resources) • **NFW** (Net use of fresh water)

**Table 7d - Other environmental information describing waste categories**

| Indicator | Unit | A1-A3    | A4       | A5       | 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  |
| NHWD      | kg   | 9.23E+01 | 0.00E+00 | 1.47E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.98E+02 | 0.00E+00  |
| RWD       | kg   | 5.50E-01 | 2.50E-06 | 1.65E-02 | 1.38E-05 | 4.60E-05 | 1.77E-04 | 1.07E-05 | -2.90E-04 |

Other environmental information describing waste categories • **HWD** (Hazardous waste disposed) • **NHWD** (Non-hazardous waste disposed) • **RWD** (Radioactive waste disposed)



Table 7e - Environmental information describing output flows

| CRU | kg                    | A1-A3    | A4       | A5       | 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 |
| MFR | kg                    | 0.00E+00 | 0.00E+00 | 5.76E+01 | 0.00E+00 | 0.00E+00 | 1.92E+03 | 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 |
| EEE | MJ per energy carrier | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EET | MJ per energy carrier | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Environmental information describing output flows • **CRU** (Components for re-use) • **MFR** (Materials for recycling) • **MER** (Materials for energy recovery) • **EEE** (Exported electrical energy) • **EET** (Exported thermal energy)



## References

- 1 GCCA's Industry EPD Tool for Cement and Concrete V5.0.  
Retrieved from <https://concrete-epd-tool.org>
- 2 Australian Life Cycle Assessment Society. (2015). Australian Life Cycle Inventory Database Initiative.  
Retrieved from <http://www.auslci.com.au>
- 3 Ecoinvent 3.10 (database). Retrieved from <https://ecoinvent.org/ecoinvent-v3-10/>
- 4 "Electricity generation in Queensland, by fuel type, physical units, calendar year" (Calendar Year 2023-QLD), Retrieved from <https://www.energy.gov.au/publications/australian-energy-statistics-table-o-electricity-generation-fuel-type-2022-23-and-2023>.
- 5 EPD International. (2021). General Programme Instructions for the International EPD® System v4.0  
Retrieved from [envirodec.com](http://envirodec.com)
- 6 EPD Australasia Regional Annex (2024) – Version 4.2 Retrieved from [epd-australasia.com](http://epd-australasia.com)
- 7 European Committee for Standardisation (CEN). (2024). EN 16757:2022: Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements
- 8 European Committee for Standardisation (CEN). (2019). EN 15804:2012+A2:2019: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products. Brussels.
- 9 International Organization for Standardization. (2015). ISO 14020 Environmental Labels and Declarations - General Principles.
- 10 International Organization for Standardization. (2017). ISO 14025 Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures. International Organization for Standardization. (2020).
- 11 ISO 14044 Environmental Management - Life Cycle Assessment - Requirements and Guidelines (2006)
- 12 ISO 14040 Environmental Management – Life Cycle Assessment – Principles and Framework (2006)
- 13 JRC Technical Report, Model for Life Cycle Assessment (LCA) of buildings. (2018)
- 14 National waste and resource recovery report 2024 – Final. (2025). Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW)



## **The Neilsen Group**

**Johnstone Road, Brendale QLD 4500**

**Phone 07 3205 5599**

**1300 CONCRETE**

[www.neilsens.com.au](http://www.neilsens.com.au)

For more information please contact our Customer Service team.

