EPD®

ISRABETON
Concrete Industries

# Environmental Product Declaration

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

## For **Israthermi B-30 - Israthermi LC 25/28** from **Israbeton**


| | |
|---|---|
| Programme: | The International EPD® System, www.environdec.com |
| Programme operator: | EPD International AB |
| EPD registration number: | S-P-12533 |
| Publication date: | 2024-03-11 |
| Valid until: | 2029-03-10 |

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


ECO PLATFORM EPD VERIFIED

# General Information

## Programme information

| | |
|---|---|
| **Programme** | The International EPD® System |
| **Address** | EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden |
| **Website** | www.environdec.com |
| **E-mail** | info@environdec.com |

## Accountabilities for PCR, LCA and independent, third-party verification

**Product Category Rules (PCR)**

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): 2019:14, Construction products, version 1.3.2, UN CPC 375

PCR review was conducted by: The Technical Committee of the International EPD® System.
A full list of members available on www.environdec.com.
The review panel may be contacted via info@environdec.com
Chair of the PCR review: Claudia A. Peña

**Life Cycle Assessment (LCA)**

LCA accountability: Shai Ben Aharon, KVS

**Third-party verification**

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
☑ EPD verification by individual verifier

**Third-party verifier:**
Prof. Ing. Vladimír Kočí, Ph.D., MBA
LCA Studio
Šárecká 5,16000
Prague 6 - Czech Republic
www.lcastudio.cz
**Approved by:** The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:
☐ Yes ☑ No

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.

ISRABETON Concrete Industries

## Company Information

**Owner of the EPD:** Israbeton

**Description of the organization:** Israbeton, part of Ashtrom Industries, offers numerous types of ready-mix concrete, cement mortar, sandstone mortar, white mortar etc.
The company is in operation for over 50 years and has developed expertise in the field, and together with the support of the other Ashtrom industry companies can provide a wide variety of products for projects in different scales.

**Product-related or management system-related certifications:** The concrete products of Israbeton are used for all types of projects and meet the SII qualification and certification requirements, and are certified by ISO 9002.

**Name and location of production site(s):** Israbeton manufacturing sites are located in Israel, in the following locations: Ad Halom, Rishon LeTsiyon, The 1000 located in Rishon LeTsiyon, Bnei Brak, Nir Yitzhak, Hazav, Atarot, Tarqumiyah, Blumfield located in Jaffa, Eilat and Taibe.

## Product Information

**Product Name:** Israthermi B-30 - Israthermi LC 25/28

**Product identification:** Ready-mix concrete

**Product description:** A special ready-mix concrete product, developed to adhere with the 1045 standard of the israeli thermal insulation code, has a very good insulation capability, high fire resistance, and lower density. By using Israthermi LC25/28 the use of isolation block is redundant. Can be applied in walls, roofs and floors, specifically good for use in cold bridges in the building and external walls.

| | |
|---|---|
| **Name of Product** | B-30 - Israthermi LC 25/28 |
| **Density [Kg/M³]** | 1,731 |
| **Compressive strength after 28 days [MPa]** | 30 |
| **Characteristic cylinder compressive strength after 28 days [MPa]** | 25 |
| **Characteristic cube compressive strength after 28 days [MPa]** | 28 |
| **Color** | Gray |

**Product test standard:** The product complies with the Israeli standards 118, 466.

**UN CPC code:** 375 - Articles of concrete, cement and plaster.

**Geographical scope:** The study represents the manufacturing of ready-mix concrete in Israbeton manufacturing in 11 sites in Israel located in: Ad Halom, Rishon LeTsiyon, The 1000 located in Rishon LeTsiyon, Bnei Brak, Nir Yitzhak, Hazav, Atarot, Tarqumiyah, Blumfield located in Jaffa, Eilat and Taibe. In addition, the transport to application of the ready-mix concrete in the construction sites in Israel. The end-of-life scenario of the products is demolishing and recycling in Israel, according to market research that was conducted.

ISRABETON Concrete Industries

# LCA information

**Functional unit / declared unit:** 1 $m^3$ of ready-mix concrete. Conversion factor to 1 $m^3$ – 1,731 kg.

**Reference Service Life:** The reference service life value is about 100 years.

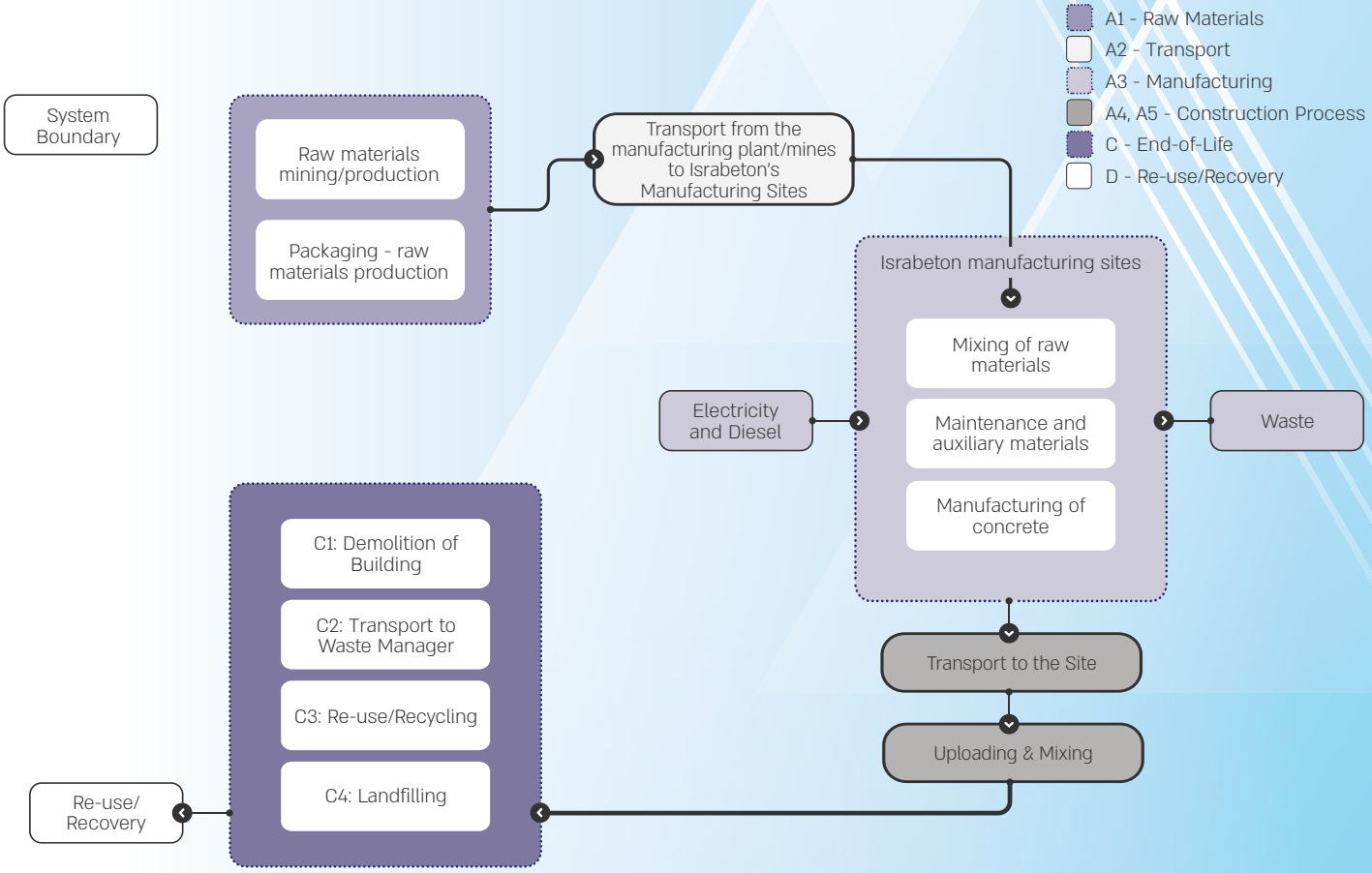
**Time representativeness:** The time coverage of the LCA's data is from January to December 2022.

**Database(s) and LCA software used:** The software used is SimaPro, Analyst 9.4.0.3. The database used is the Ecoinvent database v3.8 (2021) using the cut-off by classification approach (SCLCI, 2017).


**Description of system boundaries:** Cradle to gate with modules A4-A5, C1–C4 and module D (A1–A5 + C + D).

**Electricity grid $CO_2$ coefficient:** the $CO_2$ coefficient of the electricity grid is 0.58 kg $CO_2$-eq/kWh (2022) based on the renewable and non-renewable fuel sources in Israel.

# System Diagram



## Manufacturer's Contact Information

**Address:** Hayarkon, Bnei Brak, Israel.

**Phone Number:** *8642

**Email:** bate@ashtrom.co.il

**Website:** www.israbeton.co.il

**Name and contact information of the LCA practitioner:**
Shai Ben Aharon shai@kvs.co.il of KVS.

## Assumptions

- Assumptions were made regarding the transportation of all materials required for manufacturing and packaging the product. The calculation was distance based.
- Generic data of larger areas have been used for some materials and processes inputs.
- In cases of multiple suppliers for one raw material a proportional share was taken into account.
- The cement raw material was based on the environmental assessment results of the EPD of the purchased cement received from Israbeton's suppliers. One of the EPDs validity has expired yet it is the best data available and probably has more conservative figures.

## Cut-off Rules

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR of the EPD International Institution. The study does not exclude any hazardous materials or substances. During the life cycle of the product, no hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product. The study includes all major raw materials and energy consumption. All inputs and outputs of the unit processes with available data are included in the calculation. There is no neglected unit process of more than 1% of total mass or energy flows.

## Allocations

In this study, as per EN 15804, allocation is conducted in the following order:

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

Overall and in general, allocations were avoided in the project as there are no by products in the manufacturing process. Nevertheless, allocations were made in the general energy usage.

Allocation used in Ecoinvent 3.8 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 standard.

## Background Database

The EPD is based on the primary production data of Israbeton. The background database is Ecoinvent database v3.8 (2021). Since there are several missing datasets for Israel, background data for larger areas in which Israel is included in was used for a small part of the life cycle inventory. The electricity mix of the high voltage electricity grid according to 2022 data is given by a formal report from the Israel Electricity Authority and the water grid is modeled according to the water sources in Israel.

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 | IL, EUR, Global | IL, EUR, Global | IL | IL | IL | ND | ND | ND | ND | ND | ND | ND | IL | IL | IL | IL | IL |
| Specific data used | >90% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation - products | 0% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation - sites | ~17% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |

**Module A1 - Supply of raw materials:** The declared Israbeton's ready-mix concrete consist of aggregates mix, cement, water and additives. Two types of cements are in use, CEM I 52.5 N and CEM II 52.5 N. The module includes the extraction/production of the raw material that are taken into account in this study.

**Module A2 - Transport of raw materials:** The cement is produced locally and abroad in nearby countries, the aggregates are mainly extracted in Israel and transported locally and the additives are supplied in Israel and produces in Europe. Accordingly, transport distances are short and done by container ships and trucks.

**Module A3 - Manufacturing:** The manufacturing includes mixing of cement with aggregates, water and additives according to the relevant recipes of each product. The end product is transported to the sites using a concrete mixer. Electricity and diesel are consumed during the manufacturing process, in addition to maintenance procedures. The electricity mix of high voltage electricity grid according to 2022 data is given by a formal report from the Israel Electricity Authority, and is as follows: 21.7% of hard coal, 68% of natural gas, 9.75% of renewable and 0.55% of oil and other, with CO2 coefficient (GWP-GHG) of 0.58 kg CO2-eq/kWh.

**Module A4 - Transport:** The concrete is transported to the construction site by a concrete mixer. An average distance was calculated for each site.

**Module A5 - Construction installation:** During the installation process of the main resource that consumes is the fuel from the concrete mixer, other resources were neglected. The diesel consumption during the ready-mix concrete extraction in the construction site is estimated as 1 liter of diesel per $m^3$ of concrete.

## End-of-Life Stage (C1-C4):

**Module C1 - De-construction:** : Concrete is the main component contributing to the constructional strength in buildings, therefor it is allocated all the impact from the demolition of the whole building deconstruction stage in the end of life of the building.
An estimated average time of 2 seconds is considered for the demolishing of 1 Kg of concrete.
At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as mixed construction waste

**Module C2 - Transportation:** Transportation distance to the closest disposal area is estimated as 50 km on average by a 16-32 tonne lorry, which is the most common.

**Module C3 - Waste processing:** According to a report of the Knesset (the Israeli Parliament) from 2022, named "Treatment of Construction Waste in Israel - Data and Points of Discussion" in Hebrew (Page 9, Table 3), and according to interviews with industry executives that manage the construction waste in Israel (GREENMIX), approx. 85% of the mineral construction waste in which concrete are included in are recycled, and about 15% are landfilled. The mineral construction waste is commonly recycled to bedding aggregated products used for infrastructure and thus the dataset was modeled to fit this assumption. For the waste processing, an energy consumption of 0.01 kWh of electricity/kg of waste input was calculated.

**Module C4 - Disposal:** 15% of the concrete will be landfilled.

Resource Recovery stage (D):

**Module D - Reuse-Recovery-Recycling potential:** Module D calculates the potential environmental benefits of the recycling or reuse of materials. 85% of the product is assumed to be recycled to bedding aggregated products used for infrastructures of roads, sidewalks, etc. The calculations of this module were according to Annex D in EN 15804:2012+A2:2019.

## Content Information

| Product components | % Weight | Post-consumer material, weight-% | Biogenic material, weight-% and kg C/kg |
|---|---|---|---|
| Aggregates | 60-80% | 0 | 0 |
| Cement - CEM I or CEM II | 7-20% | 0 | 0 |
| Water | 5-10% | 0 | 0 |
| Additives | ≤1% | 0 | 0 |
| **TOTAL** | 100% | 0 | 0 |

| Dangerous substances from the candidate list of SVHC for Authorisation | EC No. | CAS No. | Weight-% per functional or declared unit |
|---|---|---|---|
| **ND** | ND | ND | ND |

# Environmental Information

The EPD is for a specific product - Environmental impacts of 1 m³ of B-30 - Israthermi LC 25/28.
The results presented are the average of all the 11 manufacturing sites:

**Potential environmental impact - mandatory indicators according to EN 15804.**

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP-fossil | kg CO2 eq. | 4.19E+02 | 8.48E+00 | 3.67E-01 | 6.11E+00 | 1.47E+01 | 1.00E+01 | 3.23E+00 | -3.70E+01 |
| GWP-biogenic | kg CO2 eq. | 7.31E-01 | 7.33E-03 | 1.30E-04 | 2.14E-03 | 7.96E-03 | -1.44E-02 | 3.86E-03 | -3.72E-02 |
| GWP-luluc | kg CO2 eq. | 2.25E-01 | 3.39E-03 | 3.67E-05 | 6.04E-04 | 6.17E-03 | 5.42E-04 | 6.76E-03 | -1.68E-02 |
| GWP-total | kg CO2 eq. | 4.20E+02 | 8.49E+00 | 3.68E-01 | 6.11E+00 | 1.47E+01 | 1.00E+01 | 3.24E+00 | -3.71E+01 |
| ODP | kg CFC 11 eq. | 2.51E-05 | 1.97E-06 | 7.85E-08 | 1.29E-06 | 3.18E-06 | 1.42E-07 | 9.34E-07 | -7.71E-06 |
| AP | mol H+ eq. | 1.30E+00 | 2.41E-02 | 3.82E-03 | 3.78E-02 | 4.33E-02 | 4.75E-02 | 2.88E-02 | -1.48E-01 |
| EP-freshwater | kg P eq. | 1.30E-01 | 6.05E-05 | 1.22E-06 | 2.01E-05 | 1.25E-04 | 2.66E-04 | 2.89E-05 | -3.72E-04 |
| EP-marine | kg N eq. | 3.30E-01 | 4.79E-03 | 1.69E-03 | 1.57E-02 | 8.62E-03 | 7.00E-03 | 1.11E-02 | -3.54E-02 |
| EP-terrestrial | mol N eq. | 3.42E+00 | 5.34E-02 | 1.85E-02 | 1.72E-01 | 9.62E-02 | 7.76E-02 | 1.21E-01 | -4.27E-01 |
| POCP | kg NMVOC eq. | 9.48E-01 | 2.05E-02 | 5.10E-03 | 4.84E-02 | 3.61E-02 | 2.10E-02 | 3.44E-02 | -1.30E-01 |
| ADP-minerals&metals* | kg Sb eq. | 2.90E+03 | 1.29E+02 | 5.04E+00 | 8.30E+01 | 2.17E+02 | 1.35E+02 | 6.44E+01 | -5.42E+02 |
| ADP-fossil* | MJ | 3.91E-04 | 3.01E-05 | 1.89E-07 | 3.12E-06 | 5.11E-05 | 3.04E-05 | 6.57E-06 | -1.85E-04 |
| WDP* | m³ | 3.33E+01 | 3.91E-01 | 7.89E-03 | 1.30E-01 | 7.61E-01 | 7.59E-01 | 1.80E+00 | -1.14E+02 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | |

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

**Potential environmental impact - additional mandatory and voluntary indicators.**

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP-GHG[1] | kg $CO_2$ eq | 4.19E+02 | 8.49E+00 | 3.68E-01 | 6.11E+00 | 1.47E+01 | 1.00E+01 | 3.24E+00 | -3.71E+01 |

[1] 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 $CO_2$ is set to zero.

ISRABETON Concrete Industries

### Use of resources

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 1.47E+02 | 1.84E+00 | 2.83E-02 | 4.67E-01 | 2.54E+00 | 7.40E+00 | 6.65E-01 | -1.01E+01 |
| PERM | MJ | 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 | 1.47E+02 | 1.84E+00 | 2.83E-02 | 4.67E-01 | 2.54E+00 | 7.40E+00 | 6.65E-01 | -1.01E+01 |
| PENRE | MJ | 2.90E+03 | 1.29E+02 | 5.04E+00 | 8.30E+01 | 2.17E+02 | 1.35E+02 | 6.45E+01 | -5.42E+02 |
| PENRM | MJ | 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 | 2.90E+03 | 1.29E+02 | 5.04E+00 | 8.30E+01 | 2.17E+02 | 1.35E+02 | 6.45E+01 | -5.42E+02 |
| SM | 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 |
| RSF | MJ | 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 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | $m^3$ | 8.33E-01 | 1.46E-02 | 2.88E-04 | 4.74E-03 | 2.52E-02 | 2.28E-02 | 4.37E-02 | -1.43E+00 |
| Acronyms | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. | | | | | | | | |

## Waste production and output flows

### Waste production

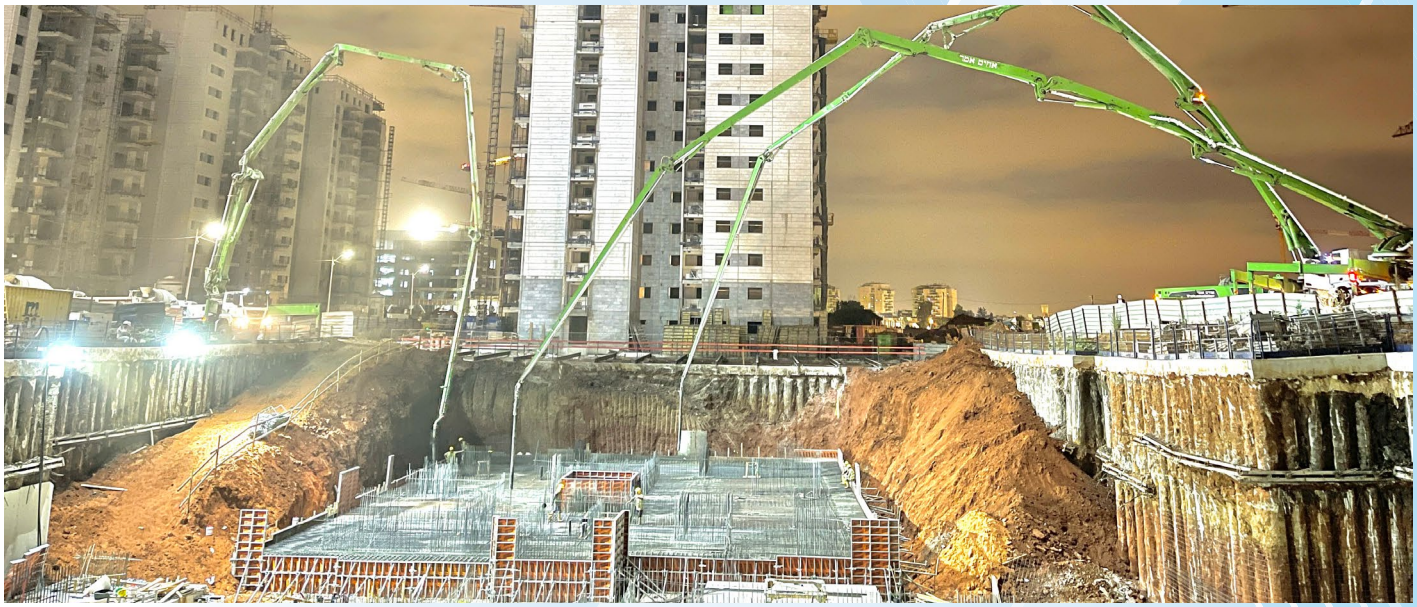
| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| Hazardous waste disposed | kg | 4.25E-03 | 3.36E-04 | 1.38E-05 | 2.27E-04 | 5.74E-04 | 2.04E-04 | 1.28E-04 | -1.43E-03 |
| Non-hazardous waste disposed | kg | 8.99E+01 | 6.74E+00 | 6.86E-03 | 1.13E-01 | 1.13E+01 | 6.85E-01 | 2.60E+02 | -2.07E+01 |
| Radioactive waste disposed | kg | 7.54E-03 | 8.69E-04 | 3.48E-05 | 5.73E-04 | 1.42E-03 | 2.11E-05 | 4.26E-04 | -3.41E-03 |

### Output flows

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| Components for re-use | 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 |
| Material for recycling | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.47E+03 |
| Materials for energy recovery | 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 |
| Exported energy, electricity | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Exported energy, thermal | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

## References


- General Programme Instructions of the International EPD® System. Version 4.0.
- "Treatment of Construction Waste in Israel - Data and Points of Discussion", by the Knesset, the Israeli Parliament, Israel, 2022.
- Ecoinvent, "System Models," [Online]. Available: https://ecoinvent.org/the-ecoinvent-database/system-models/.
- EN 15804:2012+A2
- The PCR of construction products 2019:14 v. 1.3.2
- PCR 2019: c-PCR-003 Concrete and concrete elements (EN 16757) (2023-01-02).
- "The energy economy in Israel September 2023" by The Israel Electricity Authority.
- ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations principles and procedures.
- ISO 14040:2006 Environmental management. Life cycle assessment principles and frameworks.
- ISO 14044:2006 Environmental management. Life cycle assessment requirements and guidelines.
- Ecoinvent database v3.8 (2021)
- N. M. &. V. B. &. G. Thoma, "A national-level LCA of a water supply system in a Mediterranean semi-arid climate—Israel as a case study," 2020.

## Contact Information


**Programme operator:**

EPD International AB
info@environdec.com

**LCA Owner:**

Israbeton
www.israbeton.co.il
T: *8642

**LCA author:**

KVS
www.kvs.co.il
info@kvs.co.il
T: +972-3-917 2202

**3rd Party Verifier:**

Prof. Ing. Vladimír Kočí, Ph.D., MBA LCA Studio
Šárecká 5,16000
Prague 6 - Czech Republic
www.lcastudio.cz