Program EPDPoland
Operator: MULTICERT Sp. z o.o.

Issuance date: 04.04.2025
Validation: 03.04.2025
Validity date: 04.04.2030

ConSpan

Concrete Bridge Systems

Type III Environmental Product Declaration No. EPD-P 01.04.2025

Program EPDPoland
Operator: MULTICERT Sp. z o.o.

EPD VERIFIED

VIACON

Owner of the EPD:
ViaCon Polska Sp. z o.o.
Address: ul. Przemysłowa 6,
64-130 Rydzyna,
Poland
e-mail: office@viacon.pl
Website: www.viacon.pl

EPD Program Operator:
Multicert Sp. z o.o.
Address: ul. Mydlarska 47,
04-690 Warsaw,
Poland
Website: epd.org.pl
Contact: epd@epd.org.pl

Basic information

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent body according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2.

Life cycle analysis (LCA): A1-A3, C1-C4 and D modules in accordance with EN 15804 (Cradle-to-Gate with options)

The year of preparing the EPD: 2024/2025

Product standards: EN 15050:2007+A1:2012

Service Life: 100 years

PCR: EN 16757 and EN 15804 +A2 serve as core PCR for this EPD

Declared unit: 1 ton

Reasons for performing LCA: B2B

Representativeness: Poland, Europe

Multicert Sp. z .o.o. is the operator of the EPD Polska program providing a reliable platform for publishing independently verified environmental product declarations (EPD).
www.epd.org.pl

Manufacturer

ViaCon Polska Sp. z o.o., a subsidiary of the ViaCon Group—a leading European provider of innovative infrastructure solutions—specializes in designing, producing, and installing steel structures and flexible infrastructure solutions across Central and Eastern Europe. The company offers innovative, durable, cost-efficient, and environmentally sustainable solutions, including: bridge and culvert solutions, soil stabilization systems, geotechnical solutions, stormwater management systems, drainage systems and custom engineering solutions.

Distinguished by advanced manufacturing capabilities and an experienced in-house engineering team, ViaCon Polska delivers customized solutions tailored to client needs. Its certifications, including EN 1090 Factory Production Control, ISO 9001 Quality Management, ISO 14001 Environmental Management and ISO 45001 Occupational Health and Safety Management Systems, ensure high standards and sustainability in its operations.

Serving both public and private sectors, ViaCon Polska has completed numerous projects, from large-scale bridges to complex drainage systems. With the resources and expertise of the ViaCon Group, it is a trusted partner in creating modern, sustainable infrastructure.

Products description

ConSpan is an innovative precast concrete bridge system offered by ViaCon Polska, designed for efficient and rapid construction of buried bridge structures. This modular system features an optimized arch shape that provides an ideal balance between concrete usage and structural capacity. The distinctive arch action allows for fast, set-in-place construction without the need for formwork or scaffolding. The ConSpan system consists of precast concrete elements, including the main arch segments, precast footings, headwalls, and wingwalls. These components are easily assembled on-site, allowing for customization to suit a wide range of applications. The structures are available in spans ranging from 12 to 65 feet (3.7 to 19.8 meters), with rises from 3 to 14 feet (0.9 to 4.3 meters). One of the key advantages of ConSpan is its rapid installation process. Approximately 10-15 elements (12 meters) can be assembled in a single day, with a typical 20-25 meter bridge, including the aligning system, completed in just 2-4 weeks. This is significantly faster than traditional cast-in-place bridges, which can take 2-4 months to construct. The ConSpan system offers several benefits, including reduced maintenance costs and lower life cycle costs due to the absence of a bridge deck or joints at the deck/roadway interface. The buried design provides excellent durability and longevity, with an expected service life of up to 100 years. Additionally, the box-arch geometry of ConSpan structures enhances water flow and provides improved clearance compared to traditional designs

Product Applications

ConSpan structures are versatile and can be used in various applications within the civil engineering and transportation sectors. Some common uses include:

- Stream crossings and culverts, where the clear span design minimizes waterway disturbances and reduces permit requirements
- Highway and railway underpasses or overpasses, capable of supporting heavy loads including Cooper E-80 loading for rail applications
- Wildlife crossings, providing a natural passage for animals while maintaining traffic flow above.
- Pedestrian and bicycle tunnels, offering safe passage beneath busy roadways.
- Storage facilities and conveyor enclosures for industrial and mining applications
- Airport infrastructure, including taxiway underpasses, runway extensions, and glycol storage tanks for de-icing solvents.
- Bridge rehabilitation projects, where ConSpan can be installed to support deteriorating concrete bridges while utilizing existing foundations.

More specific information (on products) is available on the producer website: www.viacon.pl

Product material declaration

The product is primarily composed of concrete, which accounts for 93 percent of the product's mass, and reinforcing steel, which makes up the remaining 7 percent of the product's mass.

Substances, REACH – Very high concern

The products do not contain any REACH SVHC substances in amounts greater than 0.1% (1000 ppm).

Product life-cycle

Raw material acquisition transportation (A1, A2)

Modules A1 and A2 cover the extraction, processing, and delivery of raw materials, primarily concrete and reinforcing steel, to the production facility. Concrete is produced from cement, aggregates, and water, while reinforcing steel is typically supplied in bars or coils. The steel may be pre-cut and bent or processed further at the facility, depending on the design specifications of the reinforced concrete products.

Reinforcing steel, together with other supporting materials—such as ties, spacers, and formwork components—serves as the primary semi-finished input for the production of reinforced concrete elements. Additional ancillary materials include mold release agents, protective coatings (e.g., curing compounds), and welding supplies (if required for steel reinforcement, such as welding rods and gases like acetylene, oxygen, and CO_2).

Materials are sourced from both domestic and EU suppliers. Transportation, covered under Module A2, involves truck transport and relies on Polish and European average fuel consumption data.

Manufacturing (A3)

The production process of prefabricated reinforced concrete elements for the ConSpan Concrete Bridge System begins with the receipt of raw materials, primarily reinforcing steel and ready-mix concrete. The concrete is prepared off-site by a subcontractor in accordance with ViaCon's specifications and delivered to the production facility in mixer trucks. Upon arrival, all materials, including reinforcing steel and concrete, undergo quality control inspections to ensure they meet the required specifications for strength, durability, and composition.

Next, the reinforcing steel proceeds to the cutting and bending stage, where it is processed into shapes and sizes necessary for the design of the ConSpan bridge elements. Simultaneously, formwork systems are prepared to provide the precise shape for the bridge components, such as arches, beams, or slab units. The reinforcing steel is carefully placed within the formwork, ensuring proper positioning and spacing in accordance with design specifications.

Once the formwork and reinforcement are ready, the delivered ready-mix concrete is poured into the molds, encasing the steel reinforcement. The pouring process is monitored to ensure even distribution and to avoid voids. Vibration techniques are employed to consolidate the concrete, enhancing its structural integrity. After pouring, the concrete undergoes the curing process, which is critical for achieving the required strength and durability.

After curing, the prefabricated ConSpan elements, including arch segments and other structural components, are removed from the molds and proceed to the finishing stage. This may involve surface treatments, such as applying protective coatings, sealants, or other treatments to enhance resistance to environmental factors like water ingress, freeze-thaw cycles, or chemical exposure.

Following the finishing stage, the elements are subjected to rigorous quality control and structural integrity testing. This includes checks for dimensional accuracy, load-bearing capacity, and adherence to project specifications to ensure the components meet the high standards required for the ConSpan Concrete Bridge System.

The final step involves preparing the elements for transport. Prefabricated components are carefully loaded onto trucks to be delivered to the construction site, where they are assembled.

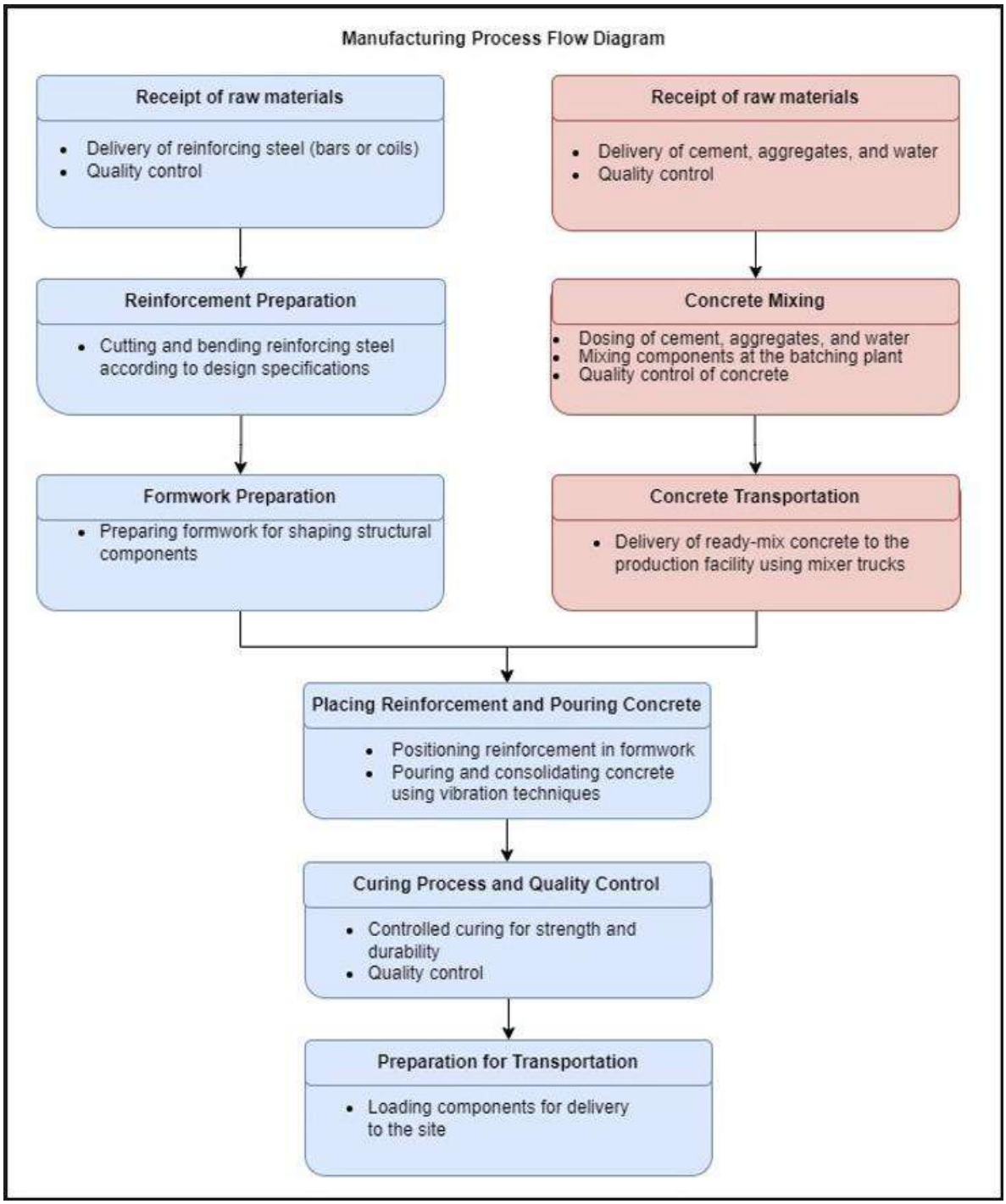

Figure 1 – Diagram of the manufacturing process

Use Stage (B1-B7)

The only inventory flow considered during the **u**se **s**tage is the CO2 absorbed by the structure through the recarbonation process. The associated impacts are presented in the B1 lifecycle stage. All other phases of the use stage (B2–B7) are deemed **not** relevant for this product.

End of life (C1, C2, C3, C4, D)

Life cycle module C1 covers the dismantling of the product, during which it is demolished, crushed, and either prepared for recycling or being sent to a landfill.

Module C2 represents the transportation of waste materials to further processing facilities or disposal site.

Module C3 involves the processing of the recyclable portion of the waste, which undergoes separation into concentrated concrete and steel scrap through sorting.

Module C4 encompasses the disposal of a portion of the demolition materials representing waste being sent to a landfill.

Module D accounts for benefits and loads beyond the system boundaries resulting from recycling of part of the concreate and steel which are calculated as a 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.

Table 2.
End-of-life scenario for the ConSpan Concrete Bridge Systems manufactured by ViaCon Polska Sp. z o.o.

Material	Material recovery	Recycling	Landfilling
Steel scrap	100%	90%	10%
Concreate	100%	90%	10%

Life cycle assessment information

Declared Unit

The declared unit is 1 ton of ConSpan concrete bridge system structures manufactured by ViaCon Polans Sp. z o.o.

Allocation

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

System boundary

The life cycle analysis (LCA) of the declared product covers: product stage – modules A1-A3, use stage - module B1 (to account for the recarbonation process), for end of life – modules C1-C4 and benefits and loads beyond the system boundary – module D (cradle-to- gate with options) in accordance with EN 15804+A2. Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculations. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

Data collection period

Primary data provided by ViaCon Polska Sp. z o.o. covers a period from 01.01.2023 to 31.12.2023 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Data quality

For foreground data, the LCA study relies on high-quality primary data gathered by ViaCon for the year 2023, including all materials used and average transport distances for material supplies. All relevant background data sets have been sourced from the GCCA Industry EPD Tool for cement and concrete (V5.0) software's database: ecoinvent v3.10, which includes consistent and well-documented data sets accessible in the ecoinvent online database or through the ecoinvent database documentation. No specific data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency are judged as good.

Assumptions and estimates

The impacts of the representative ConSpan concrete bridge system structures were aggregated using weighted average. Impacts were inventoried and calculated for ConSpan concrete bridge system structures manufactured by ViaCon Polska Sp.z o.o.

Calculation rules

LCA was performed using GCCA Industry EPD Tool for cement and concrete (V5.0) software developed in accordance with EN 15804+A2 and EN 16757. The impact indicators were determined using characterization methods (models) aligned with the stipulations outlined in the Appendix C of EN 15804+A2.

Geographic representativeness

The specified land or region where the product system is manufactured and managed is Poland, Europe.

Additional information

The emission factor for Polish electricity form Ecoinvent version 3.10 was supplemented with current data representing the residual electricity mix for Poland published by AIB (Association of Issuing Bodies) for 2023 of 0.788 kg CO2e per kWh.

Life cycle assessment (LCA) – Results

Table 3 System boundaries for the environmental characteristic of the product

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MND	MND	MD	MND	MND	MND	MND	MND	MND	MD	MD	MD	MD	MD

Table 4. Life cycle assessment (LCA) results of the ConSpan precast concrete bridge system manufactured by ViaCon Polska Sp. z o.o. – environmental impacts (DU: 1 ton)

Impact category	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
Global Warming Potential (Total)	kg $CO_{2\ eq.}$	2,93E+02	1,02E+01	2,69E+01	3,30E+02	-5,12E+00	4,02E+00	4,25E+00	1,10E+01	-7,34E-02	-7,37E+01
Global Warming Potential (Fossil Fuels)	kg $CO_{2\ eq.}$	2,93E+02	1,02E+01	2,70E+01	3,30E+02	-5,12E+00	4,01E+00	4,24E+00	1,10E+01	-7,38E-02	-7,38E+01
Global Warming Potential (Biogenic)	kg $CO_{2\ eq.}$	-1,65E-01	9,05E-04	-3,58E-02	-2,00E-01	0,00E+00	4,39E-04	9,30E-04	4,43E-03	9,29E-05	8,00E-02
Global Warming Potential (Land Use and Land Use Change)	kg $CO_{2\ eq.}$	3,75E-01	4,13E-03	3,35E-03	3,82E-01	0,00E+00	3,49E-04	2,09E-03	4,41E-03	3,47E-04	-3,84E-02
Ozone Depletion Potential	kg $CFC_{11\ eq.}$	1,87E-06	1,55E-07	2,07E-07	2,23E-06	0,00E+00	6,14E-08	6,29E-08	1,57E-07	1,95E-08	-3,69E-07
Acidification Potential	mol H+ eq.	1,09E+00	2,87E-02	2,40E-01	1,36E+00	0,00E+00	3,62E-02	1,69E-02	9,57E-02	4,78E-03	-2,89E-01
Eutrophication Potential (Freshwater)	kg P eq.	2,54E-02	2,67E-04	3,24E-03	2,90E-02	0,00E+00	3,82E-05	1,46E-04	4,86E-04	1,83E-05	-8,79E-03
Eutrophication Potential (Marine)	kg $N_{eq.}$	2,02E-01	8,05E-03	3,23E-02	2,42E-01	0,00E+00	1,68E-02	5,45E-03	4,06E-02	1,82E-03	-6,43E-02
Eutrophication Potential (Accumulated Exceedance)	mol $N_{eq.}$	2,60E+00	8,74E-02	3,42E-01	3,03E+00	0,00E+00	1,84E-01	5,92E-02	4,42E-01	1,99E-02	-6,98E-01
Formation Potential of Tropospheric Ozone	kg $NMVOC_{eq.}$	8,70E-01	4,16E-02	1,02E-01	1,01E+00	0,00E+00	5,49E-02	2,31E-02	1,32E-01	7,12E-03	-2,41E-01
Abiotic Depletion Potential for Non-Fossil Resources	kg $Sb_{eq.}$	8,67E-04	3,09E-05	1,58E-04	1,06E-03	0,00E+00	1,47E-06	1,19E-05	1,88E-05	1,08E-06	-2,40E-04
Abiotic Depletion for Fossil Resources Potential	MJ	2,52E+03	1,49E+02	2,93E+02	2,96E+03	0,00E+00	5,25E+01	6,12E+01	1,53E+02	1,65E+01	-7,61E+02
Water Deprivation Potential	m^3 eq.	1,21E+02	6,90E-01	2,72E+00	1,25E+02	0,00E+00	1,29E-01	3,57E-01	8,92E-01	4,62E-02	-4,02E+01

Table 5. Life cycle assessment (LCA) results of the ConSpan precast concrete bridge system manufactured by ViaCon Polska Sp. z o.o. – additional impacts indicators (DU: 1 ton)

Impact category	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
Potential Incidence of Disease due to PM Emissions	Disease incidence	2,00E-05	8,97E-07	3,99E-07	2,13E-05	0,00E+00	1,03E-06	4,53E-07	2,44E-06	1,09E-07	-6,17E-06
Potential Human Exposure Efficiency Relative to U235	kBq U235 eq.	9,51E+00	1,29E-01	2,46E-01	9,89E+00	0,00E+00	2,35E-02	7,88E-02	4,17E-01	1,05E-02	-2,45E+00
Potential Comparative Toxic Unit for Ecosystems	CTUe	4,18E+03	3,73E+01	7,20E+01	4,29E+03	0,00E+00	7,44E+00	1,76E+01	2,57E+01	2,26E+00	-2,24E+03
Potential Comparative Toxic Unit for Humans (Cancer)	CTUh	1,02E-05	5,02E-08	3,08E-08	1,03E-05	0,00E+00	1,57E-08	2,78E-08	4,17E-08	3,05E-09	-6,72E-06
Potential Comparative Toxic Unit for Humans (Non-Cancer)	CTUh	1,03E-05	9,53E-08	2,33E-07	1,06E-05	0,00E+00	7,15E-09	3,91E-08	4,24E-08	2,97E-09	-9,56E-07
Potential Soil Quality Index	dimensionless	9,08E+02	1,25E+02	1,22E+02	1,15E+03	0,00E+00	3,69E+00	5,70E+01	2,90E+01	3,25E+01	-2,81E+02

Table 6. Life cycle assessment (LCA) results of the ConSpan precast concrete bridge system manufactured by ViaCon Polska Sp. z o.o.– the resource use (DU: 1 ton)

Impact category	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
Use of Renewable Primary Energy Excluding Renewable Primary Energy Resources Used as Raw Materials	MJ	1,73E+02	1,99E+00	4,80E+01	2,23E+02	0,00E+00	3,22E-01	1,20E+00	5,58E+00	1,53E-01	-4,68E+01
Use of Renewable Primary Energy Resources Used as Raw Materials	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	0,00E+00	0,00E+00
Total Use of Renewable Primary Energy Resources	MJ	1,73E+02	1,99E+00	4,80E+01	2,23E+02	0,00E+00	3,22E-01	1,20E+00	5,58E+00	1,53E-01	-4,68E+01
Use of Non-Renewable Primary Energy Excluding Non-Renewable Primary Energy Resources Used as Raw Materials	MJ	2,49E+03	1,40E+02	2,93E+02	2,93E+03	0,00E+00	5,25E+01	5,58E+01	1,42E+02	1,65E+01	-7,41E+02
Use of Non-Renewable Primary Energy Resources Used as Raw Materials	MJ	3,00E+01	9,07E+00	1,29E-01	3,92E+01	0,00E+00	0,00E+00	5,42E+00	1,14E+01	0,00E+00	-2,08E+01
Total Use of Non-Renewable Primary Energy Resources	MJ	2,52E+03	1,49E+02	2,93E+02	2,96E+03	0,00E+00	5,25E+01	6,12E+01	1,53E+02	1,65E+01	-7,61E+02
Use of Secondary Material	kg	1,30E+02	0,00E+00	0,00E+00	1,30E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of Renewable Secondary Fuels	MJ	6,61E+01	0,00E+00	0,00E+00	6,61E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of Non-Renewable Secondary Fuels	MJ	1,15E+02	0,00E+00	0,00E+00	1,15E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net Use of Fresh Water	m^3	1,93E+00	2,07E-02	1,45E-01	2,09E+00	0,00E+00	3,41E-03	1,02E-02	2,49E-02	1,71E-02	-8,16E-01

Table 7 Life cycle assessment (LCA) results of the ConSpan precast concrete bridge system manufactured by ViaCon Polska Sp. z o.o. – waste categories (DU: 1 ton)

Impact category	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
Hazardous Waste Disposed	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
Non-Hazardous Waste Disposed	kg	5,37E-02	0,00E+00	0,00E+00	5,37E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,29E+01	0,00E+00
Radioactive Waste Disposed	kg	2,27E-03	3,16E-05	5,64E-05	2,36E-03	0,00E+00	5,77E-06	1,94E-05	1,02E-04	2,57E-06	-6,05E-04
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	0,00E+00	0,00E+00
Materials for Recycling	kg	0,00E+00	0,00E+00	6,33E+01	6,33E+01	0,00E+00	0,00E+00	0,00E+00	9,70E+02	0,00E+00	0,00E+00
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	0,00E+00	0,00E+00
Exported Energy	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

Verification

The external verification procedure for this Environmental Product Declaration (EPD) has been carried out in accordance with the requirements of ISO 14025 standards. Once the verification process is complete, the EPD remains valid for a period of 5 years. There is no need to recalculate the parameters contained in the EPD after this period, provided that the data underlying the declaration have not changed substantially.

EPD Contributors

Manufacturer representative:	Tomasz Poprawski, Production Director
EPD External verifier:	Izabela Sztamberek Sochan, Ph.D.
Note: The sole ownership, liability, and liability of this declaration are with the owner. Construction product declarations may not be comparable if they do not comply with EN 15804. For detailed information on comparability, please refer to EN 15804 and ISO 14025.	

Normative references

- EN 15804:2012+A2:2019 “Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products”
- EN 16757:2022 is: "Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements”
- ISO 14025:2006, ”Environmental labels and declarations – Type III environmental declarations Principles and procedures”
- EN 15050:2007+A1:2012 "Precast concrete products - Bridge elements"
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- EN 15942:2012 ”Sustainability of construction works – Environmental product declarations - Communication format business-to-business”
- World Steel Association 2017 Life Cycle inventory methodology report for steel products
- GCCA industry EPD tool for cement and concrete (V5.0) LCA Model, International version - GreenDelta GmbH Alt-Moabit 130 10557 Berlin Germany.

EPD Certification

Program EPDPoland Operator: MULTICERT Sp. z o.o.

Reg. No. EPD-P 01.04.2025

CERTIFICATE

EPD TYPE III DECLARATION

(ENVIRONMENTAL PRODUCT DECLARATION)

This document confirms that the Environmental Product Declaration developed by
ViaCon Polska Sp. z o.o. for ConSpan Concrete Bridge Systems,
manufactured in accordance with standard
EN15050:2007+A1:2012
meets the requirements of standards
EN 15804 + A2 and ISO 14025,
and that the data contained therein has been prepared correctly.

EPD Environmental Product Declaration EPD VERIFIED EPD POLAND

Verification carried out by:
Izabela Sztamberek Sochan, Ph.D.

MULTICERT JEDNOSTKA CERTYFIKUJĄCA

Program Manager
Grzegorz Suwara

This document is valid until April 4, 2030, or until EPD is deregistered and its publication on the website www.epd.org.pl is discontinued.

EPD Polska Registration Office,
Warsaw, April 04.2025

www.epd.com.pl