SuMPO EPD JAPAN VERIFIED

SuMPO EPD Japan

Third party

Environmental Product Declaration

In conformance with

ISO14025 | ISO14040 | ISO14044

SOKAN

SOKAN Inc.

Highly Durable PCaPC Pretension Girder & Beam (Fc=60N/mm2)

Registration number	Verification date	Publication date	Expiration date	EPD type
SuMPO-EPD-2512-22-1	2025/12/18	2025/12/26 * First publication date	2030/12/17	Multiple Products EPD

Additional standards in conformance

ISO21930:2017

EPD can be updated or withdrawn during the validity period. To confirm the validity of this EPD, check the following website: https://ecoleaf-label.jp/epd/search

●General Information

＞Programme

Programme name	SuMPO EPD Japan
Programme operator	Sustainable Management Promotion Organization (SuMPO)
Address	KANDA SQUARE GATE 4F, 14-8, Uchikanda 1-chome, Chiyoda-ku, Tokyo, 101-0047, Japan
Website	https://ecoleaf-label.jp

＞GPI and PCR

GPI	SuMPO EPD Japan General Program Instructions v.2.1.1
PCR name	Core-PCR for Construction products v2.0.1
PCR registration number	SuMPO-PCR-01000-2-0-1
PCR publication date	2025/03/31
PCR review panel chair	President, Japan Sustainable Housing and Building SDGs Promotion Center (General Incorporated Foundation); Professor Emeritus, Keio University — Toshiharu Ikaga
PCR valid until	2030/03/30
PCR issuer	Sustainable Management Promotion Organization (SuMPO)

＞Verification

Verification Type	Third-party verification in conformance with ISO14025 and ISO21930:2017		
	☐ Internal	■ External	
	☐ Third-party verification by individual verifier	■ Third-party verification by verification body	☐ Third-party verification by system certification
Verification body	KAKEN TEST CENTER General Incorporated Foundation — Shohei Ui		

＞Standards

Standards in conformance with;	■ ISO14040:2006	■ ISO14044:2006	☐ ISO14067:2018
	■ ISO14025:2006	☐ ISO21930:2007	■ ISO21930:2017
	☐ EN15804+A2	☐ EN50693:2019	☐ ISO/IEC63366:2025

EPD owner is responsible for the information contained in the EPD and for environmental claims related to the information. For any inquiries or requests regarding the content of the EPD, please contact the EPD owner.

EPDs are comparable only if they comply with the same standards, use the same sub-PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works. Comparability of EPDs is limited to those applying a functional unit.

The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceedance of thresholds, safety margins or risks.

When using weighted averages for calculation, the life cycle impact assessment results, life cycle inventory analysis-related information, waste-related information, and environmental information on output flows do not correspond to information about a specific product.

●EPD Owner's Information

Name of company and dept.	Sokan Inc. Seki Plant
Address	970 Okugome, Hiraga, Seki-city, Gifu, Japan
Contact	+81-575-22-890
LCA practitioner	Woonerf Inc.
Company description	Sokan, as a collaborative partner of Kurosawa Construction, receives technical support and manufactures precast and prestressed concrete structural products.

Product Information

Product name		Highly Durable PCaPC Pretension Girder & Beam (Fc=60N/mm2)		
Product /model number		SOKAN-Pre-PG-PB-60		
Product sepcification	Function	Structural beam for buildings (reinforced concrete product)		
	Mass	2,581kg	Conversion factor	2,581kg/m³
	Applications	Beam member for buildings using the Prestressed Concrete (PC) construction method		
	TS*	PC members certified by the Prefabricated Building Association in accordance with JASS 10		
Service life	Service life	200 years		
	In-use conditions	Seismic-isolated buildings and buildings with precast, prestressed concrete structures		
	reference	Verification of the validity of the calculation report on the service life of building structural frames (Confirmation Result Report dated May 25, 2020)		
Manufacturing site(s)		Sokan Inc. Seki Plant (Seki-city, Gifu, Japan)		
Product description		This product was developed as a structural beam using high-strength concrete, in which prestressing force is applied to PC steel tendons prior to concrete hardening, and stress is introduced after the concrete has achieved its design strength. This process prevents cracking that could lead to deterioration, inhibits the penetration of degradation factors such as carbonation, and minimizes long-term deterioration due to aging.		
Website		-		

* TS: technical specifications,

Product Content

Product components	Propotion (%)	Mass (unit)	
Cement	17.4	449.00	kg
Admixtures	0.2	4.17	kg
Aggregates	75.8	1956.53	kg
Reinforcing steel and PC steel tendons	6.5	168.02	kg
Other raw materials (sheaths, spacers, etc.)	0.1	3.42	kg
Packaging materials	Propotion (%)	Mass (unit)	
-	-	-	-

Biogenic Carbon Content

Item	Content (kg-C)	Content (kg-CO_2 eq)
Biogenic carbon content per product	-	-
Biogenic carbon content in packaging	-	-

●LCA-related Information

＞EPD Type Information

EPD type	Product type	☐ Single product EPD	■ Multiple products EPD	☐ Industry-wide EPD	
	Site type	■ Single site	☐ Multiple sites		
	Value	☐ Specific	■ Average	☐ Representative	☐ Worst case
Geographical coverage		Global			
Description of representativeness for multiple-products/sites EPD		The raw materials used per 1 m^3 for each product are identical, and all products are manufactured at the same site in Japan. Furthermore, primary data on all raw material inputs and energy consumption have been collected and used for calculation and evaluation, ensuring representativeness.			
Description of variation for multiple-products/sites EPD		All products are produced at the same site under identical conditions for material inputs (excluding reinforcing steel and PC steel tendons) and energy consumption per declared unit of 1 m^3. Differences in the quantity of reinforcing steel and PC steel tendons per 1 m^3 result in calculation variations that remain within ±10% for the relevant disclosure items.			
Description of products covered in the multiple products EPD		The EPD is disclosed based on conversion to 1 m^3 for both large and small beam products manufactured using the same site, materials, and processes.			

＞LCA Information

Declared unit		Per 1 m^3 of the product		
Mass per declared unit (Conversion factor to mass)		Per 1 m^3 of the product: 2,581 kg/m^3 (Calculated value based on production during the reference period)		
Reference flow (number of products required to fulfil the function)		-		
System boundary		■ Cradle-to-Gate	☐ Cradle-to-Gate with options	☐ Cradle-to-Grave
LCA software		MiLCA ver1.2.1.5		
LCI database		IDEA v3.4		
Characterization model		GWP IPCC2021 with LULUCF 100a、LIME2		
Use of other background data		-		
Secondary data quality		The calculation was performed using secondary data that meets the data quality requirements specified in the GPI. Data quality assessment was conducted in accordance with ISO 14044:2006 (Environmental management — Life cycle assessment — Requirements and guidelines), section 4.2.3.6.		
Primary data collection sites		Seki Plant (Seki-city, Gifu, Japan)		
Primary data collection period		April 2024 – March 2025		
Biogenic carbon		☐ 0/0 approach	■ -1/+1 approach	
Information about electricity	Use	■ Average consumption mix	☐ Others	
	Type	-		
	Purchase date	-		
	Issuing body	-		

＞Modules

Production stage			Construction stage		Use stage							End-of-life stage				Suppl. info
					Use					Operation						
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Extraction and upstream production	Transport to factory	Manufacturing	Transport to site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / Demolition	Transport to waste processing or disposal	Waste processing	Disposal of waste	Potential net benefits
■	■	■	–	–	–	–	–	–	–	–	–	–	–	–	–	–

■ : declared module　　– : module not declared

＞Allocation

In this calculation, process subdivision and allocation were considered according to the procedures described in the GPI. For the allocation of fuel, electricity, and steam in the manufacturing process, production volume (physical quantity) was used as the basis, since there is no variation in processes or time between the target products and non-target products due to the nature of the products. Similarly, for other raw materials with difficult usage tracking (such as rust inhibitors, sheath joints, spacers, and resin joints), allocation was also performed based on production volume (physical quantity), as there is no difference in usage between target and non-target products.

＞Cut-off rules

Processes with negligible environmental impact and for which data collection was difficult were cut off by applying the 5% cutoff criterion specified in the PCR.

＞System Boundary

The system boundary was established in accordance with the PCR. The calculation scope covers Cradle-to-Gate stages A1, A2, and A3. The temporal system boundary is 100 years.
The following processes were excluded from the calculation scope as outside the system boundary, based on PCR section 4.4.5:
-Processes related to employee work activities and transportation
-Processes related to research and development or administrative tasks
-Processes for the production and construction of capital goods such as manufacturing facilities and equipment (excluding power plants and power generation equipment)
-Processes for the manufacturing of transportation vehicles such as trucks and ships
-Processes related to general-purpose materials (e.g., work clothes, gloves) that are also used outside the production of the assessed product

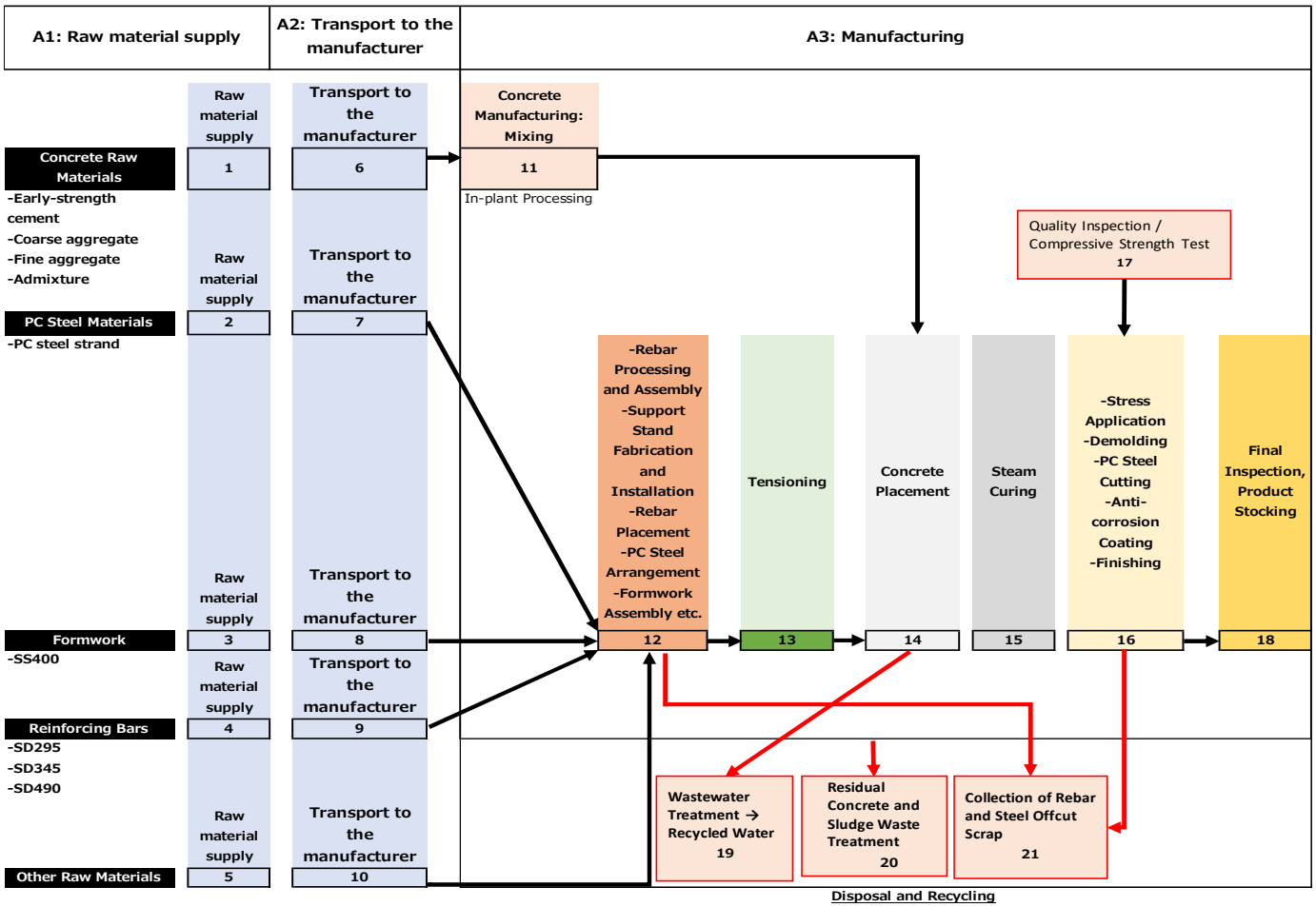
＞Scenario

Modules	Description
A2	The vehicle type and loading rate during transportation were applied according to the PCR scenario. For PC steel tendons procured from overseas, primary data for the land route from the overseas factory to the port was difficult to obtain; therefore, the PCR scenario of 500 km was applied.
A3	The vehicle type and loading rate during transportation were applied according to the PCR scenario.

＞Electricity Modelling

For all life cycle stages considered, the calculation was performed using data for the Japanese average grid electricity in 2021.

＞Life Cycle Sytem Diagram



●LCA Result

＞LCIA Indicators

		Production stage				Construction stage		Use stage							End-of-life stage				Supple. info
								Use					Operation						
		A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP - total	kg-CO_2eq	7.16E+02	4.04E+01	3.03E+01	7.87E+02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWP - fossil	kg-CO_2eq	7.15E+02	4.03E+01	3.02E+01	7.86E+02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWP - biogenic	kg-CO_2eq	1.99E-01	6.92E-03	9.68E-04	2.07E-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWP - land use and land use change	kg-CO_2eq	3.21E-01	3.71E-02	2.44E-02	3.83E-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ODP: Ozone depletion potential	kg-CFC-11eq	2.16E-05	1.43E-09	9.58E-07	2.25E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EP: Eutrophication potential	kg-PO_4^3-eq	2.33E-03	1.87E-07	2.00E-06	2.33E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AP: Acidification potential	kg-SO_2eq	8.95E-01	5.18E-02	2.49E-02	9.72E-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POCP: Photochemical oxidant creation potential	kg-C_2H_4eq	1.88E-03	3.46E-04	6.72E-02	6.94E-02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optional indicators																			
ADP - elements	kg-Sbeq	5.38E-03	1.53E-07	8.36E-05	5.46E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWP - aircraft	kg-CO_2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

＞LCI - Primary Resource Use

		Production stage				Construction stage		Use stage							End-of-life stage				Supple. info
								Use					Operation						
		A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
RPR_E*	MJ	9.54E+02	2.11E-01	1.60E+02	1.11E+03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPR_M*	MJ	2.72E+00	3.76E-04	2.96E-03	2.72E+00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$NRPR_E$*	MJ	7.35E+03	4.44E+02	6.48E+02	8.44E+03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$NRPR_M$*	MJ	5.44E+01	1.41E-03	1.96E-01	5.46E+01	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*RPRE: Renewable primary resources used as an energy carrier, RPRM: Renewable primary resources with energy content used as material, NRPRE: Non-renewable primary resources used as an energy carrier, NRPRM: Non-renewable primary resources with energy content used as material.

＞LCI- Secondary Resources Use

		Production stage				Construction stage		Use stage							End-of-life stage				Supple. info
								Use					Operation						
		A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
SM： Use of secondary material	kg	1.72E+02	1.61E-04	2.08E-02	1.72E+02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RSF： Renewable secondary fuels	MJ	1.15E+00	1.52E-04	4.53E+00	5.68E+00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NRSF： Non-renewable secondary fuels	MJ	5.67E+01	4.96E-04	7.50E-01	5.75E+01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RE： Use of recovered energy	MJ	2.62E+00	8.36E-04	8.34E-01	3.45E+00	-	-	-	-	-	-	-	-	-	-	-	-	-	-

＞LCI - ADP-fossil and Consumption of freshwater

		Production stage				Construction stage		Use stage							End-of-life stage				Supple. info
								Use					Operation						
		A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP - fossil	MJ	5.75E+03	5.49E+02	4.19E+02	6.71E+03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Consumption of freshwater resources	m^3	2.11E+00	1.12E-03	4.50E-01	2.56E+00	-	-	-	-	-	-	-	-	-	-	-	-	-	-

＞Waste Indicators

		Production stage				Construction stage		Use stage							End-of-life stage					Supple. info
								Use					Operation							
		A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-	-	-	-	-	-	-	-	-	-	-	-	-		-
non-hazardous waste disposed	kg	4.69E+00	3.36E-02	5.52E-02	4.78E+00	-	-	-	-	-	-	-	-	-	-	-	-	-		-
high-level radioactive waste	㎥	7.03E-09	1.43E-12	9.78E-10	8.01E-09	-	-	-	-	-	-	-	-	-	-	-	-	-		-
intmd. and low-level radioactive waste	㎥	2.94E-06	5.98E-10	4.09E-07	3.35E-06	-	-	-	-	-	-	-	-	-	-	-	-	-		-

＞Output Flow Indicators

			Production stage				Construction stage		Use stage							End-of-life stage					Supple. info
									Use					Operation							
			A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Components for reuse		kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-	-	-	-	-	-	-	-	-	-	-	-	-		-
Materials for recycling		kg	0.00E+00	0.00E+00	1.12E+02	1.12E+02	-	-	-	-	-	-	-	-	-	-	-	-	-		-
Material for energy recovery		kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-	-	-	-	-	-	-	-	-	-	-	-	-		-
Exported energy from waste (energy recovery efficiency≧60%)		MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-	-	-	-	-	-	-	-	-	-	-	-	-		-
Incineration of waste (energy recovery efficiency＜60%)	Waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-	-	-	-	-	-	-	-	-	-	-	-	-		-
	Recovered energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-	-	-	-	-	-	-	-	-	-	-	-	-		-
Waste disposed in landfill and energy recoved from landfill gas	Waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-	-	-	-	-	-	-	-	-	-	-	-	-		-
	Recovered energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-	-	-	-	-	-	-	-	-	-	-	-	-		-

＞**Description of LCA Results**

This declaration covers the manufacturing stage (A1: raw material supply, A2: transportation of raw materials, A3: product manufacturing).
Residual concrete generated during production is reused as recycled roadbed material by the receiving party.
Sludge (dewatered cake) is reused as recycled civil engineering material.
Wash water from residual concrete processing is stored in a pool after sludge (dewatered cake) separation and reused as recycled water; therefore, no external discharge occurs.
The calculation results for the target products may vary depending on the year of data collection, as the quantity of products ordered is not constant.

●Additional Environmental Information

＞**Additional Environmental Information not related to LCA**

The factory is certified with "N Certification" by the Prefabricated Building Association (General Incorporated Foundation).
No hazardous substances are present.

＞**Information on Hazardous Substances**

Hazardous materials name	CAS No.	Standards or regulations
-	-	-

Release of dangerous substances from construction products
NA

●Definitions of Terms

NA

●References

・ISO14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
・ISO14040:2006 Environmental management - Life Cycle Assessment - Principles and framework
・ISO14044:2006 Environmental management - Life Cycle Assessment - Requirements and guidelines
・ISO21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services

●Version History

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