Environmental Product Declaration

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

HYNDS PIPE SYSTEMS

Hynds Pinnacle Precast Concrete Inspection Chambers and Cesspits

EPD of multiple products, based on a representative product. The products covered in the EPD are listed on page 18.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
Regional Programme:	EPD Australasia, www.epd-australasia.com
EPD registration number:	EPD-IES-0023138:001
Publication date:	2030-06-16
Date of validity:	2025-06-17

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.

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ABOUT US

Founded in 1973 by John and Léonie Hynds, the privately owned Hynds Group of Companies is New Zealand's premier product supplier for the management of water and water-based waste in the civil and rural infrastructure markets.

Hynds Pipe Systems Limited is the largest operating company within the Hynds Group, and is split into two operating divisions: Manufacturing and Sales & Distribution.

Hynds Concrete Manufacturing operates six factory sites across New Zealand, operating independently audited ISO9001 quality, ISO45001 health and safety, and ISO14001 environmental management systems (see hynds.co.nz/about-us/ for certificates).

Hynds operates a sales & distribution network of 36 branches and 3 distribution centres throughout New Zealand supplying over 40 000 product types for drainage, watermain, environmental, industrial process and rural applications. The Hynds' fleet of 70 delivery trucks ensure reliable stock availability and delivery to all corners of the country.

From its early inception five decades ago, Hynds has been focused on delivering positive change with industry-leading, sustainable solutions. The manufacture of products to support stormwater and wastewater treatment, and ultimately to protect the environment, remains at the heart of our product innovation today.

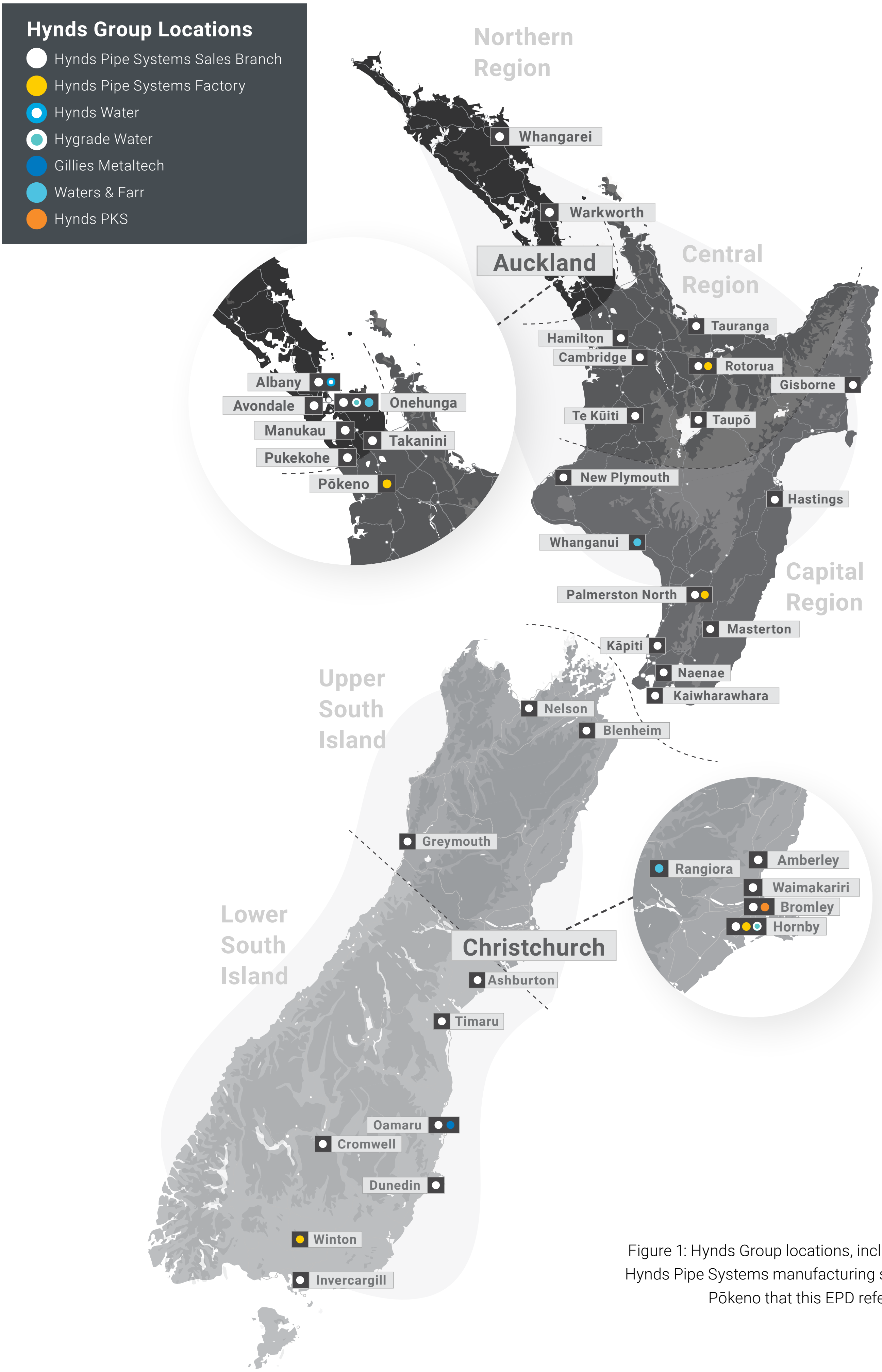

Figure 1: Hynds Group locations, including Hynds Pipe Systems manufacturing site in Pōkeno that this EPD refers to.

HYNDS SUSTAINABILITY

Our business was built around finding sustainable solutions to support the three waters *(drinking water, wastewater and stormwater infrastructure services)* and ultimately keeping our country's waterways clean and our communities safe – both for today and for future generations.

Hynds has adopted a sustainability framework which focuses on three strategic pillars; the planet (our natural environment), people (our people but also our wider communities and stakeholders) and products (innovating and building resilience into what we do to meet the needs of future generations).

Addressing the effects of climate change is a huge challenge that we all face. Hynds believes that addressing climate change will make us better off and is committed to New Zealand's transition to a low-emissions economy. Hynds has committed to a 42% reduction in Scope 1 (direct) and Scope 2 (indirect) carbon emissions by 2032.

To support our customer's sustainability goals, Hynds now offers a lower carbon product range, HyndsLC®. The new HyndsLC® range assists our customers in meeting their sustainability requirements without compromising on quality and durability.

For more information on Hynds sustainability framework and HyndsLC® range, visit
hynds.co.nz/sustainability/
or email sustainability@hynds.co.nz.

HYNDS LC®
Our low carbon future

PRODUCT INFORMATION

Products Covered by EPD

This EPD covers the Hynds Pinnacle Precast Concrete Inspection Chambers and Cesspits manufactured at Hynds state-of-the-art precast concrete manufacturing plant in Pōkeno. The full range of products covered by this EPD are given in the Product Mass Table (Table 16).

The Hynds Pinnacle Precast Concrete Inspection Chambers and Cesspits range is generally only supplied to North Island projects but can be shipped to South Island projects when required.

Product Description

As the leading manufacturer of reinforced concrete products in New Zealand, Hynds' Inspection Chambers and Cesspits are available in a wide range of diameters and heights.

Hynds Reinforced Concrete Manhole Risers are manufactured using high strength concrete (50 MPa or greater), hard drawn steel wire. The concrete consists of coarse and fine aggregates, cement, supplementary cementitious materials (SCMs) and chemical admixtures.

Hynds Pinnacle Precast Concrete Inspection Chambers and Cesspits are designed to be used as part of stormwater drainage systems.

Declared Unit

The declared unit for the EPD is one kg of reinforced concrete Inspection Chambers and Cesspits. A conversion table is provided with product weights for all products covered by this EPD, as required (see Table 16).

Design Standard

Hynds Pinnacle Precast Concrete Inspection Chambers and Cesspits are designed and manufactured to the requirements of NZS 3101 and NZS 3109.

The Standard ranges of Hynds Reinforced Concrete Inspection Chambers and Cesspits have a specified intended service life of 100 years when correctly installed in a non-aggressive environment.

Packaging

The product is transported without packaging.

Dangerous Substances

All products covered by this study as supplied are non-hazardous, and do not contain any substances of very high concern as defined by European REACH regulation in concentrations >0.1% (m/m). Precast concrete products and pipes are classified as non-dangerous goods according to the Land Transport Rule: Dangerous Goods 2005 (ECHA, 2022).

When concrete products are cut, sawn, abraded or crushed, dust is created which contains crystalline silica, some of which may be respirable (particles small enough to go into the deep parts of the lung when breathed in), and which is hazardous. Exposure through inhalation should be avoided. Dust from these products is classified as Hazardous under the Hazardous Substances and New Organisms Act 1996 (HSNO Act) and is subject to Workplace Exposure Standards (WorkSafe NZ WES-BEI indices Edition 13, April 2022).

Table 1: Industry classification

Product	Classification	Code	Category
Product name/type	UN CPC Ver.2	3755	Prefabricated structural components for building or civil engineering, of cement, concrete or artificial stone
	ANZSIC 2006	2034	Concrete Product Manufacturing

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Table 2: Composition of Hynds Pinnacle Precast Concrete Inspection Chambers and Cesspits (per 1 kg)

Product components	Weight, kg	Post-consumer recycled material, weight-% of product	Biogenic material, weight-% of product	Biogenic material, kg C/product or declared unit
Aggregate	0.426 (0.401 - 0.438)	0	0	0
Fine sand	0.235 (0.213 - 0.242)	0	0	0
GP Cement	0.129 (0.121 - 0.151)	0	0	0
Slag	0.0297 (0.0280 - 0.0634)	0	0	0
Plasticiser	9.51E-04 (8.96E-04 - 0.00131)	0	0	0
Superplasticiser	9.51E-04 (8.96E-04 - 0.00106)	0	0	0
Limestone	0.0396 (0.0368 - 0.0408)	0	0	0
Water	0.103 (0.0830 - 0.106)	0	0	0
Bar	0.0369 (0 - 0.0926)	0	0	0
Total	1	0	0	0

**Individual masses may not sum to total due to rounding. See Table 21 for mass conversion factors.*

No products declared within this EPD contain substances exceeding the limits for registration according to the European Chemicals Agency's "Candidate List of Substances of Very High Concern for authorisation" (European Union, 2024). Reinforced concrete products are not classified as dangerous goods according to the Land Transport Rule: Dangerous Goods 2005.

Table 3: Composition of packaging (per 1 kg of pipe)

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/ kg of product
Product's packaging	0	0	0
Total	0	0	0

Manufacturing Process

Hynds Pinnacle Precast Concrete Inspection Chambers and Cesspits are manufactured at Hynds state-of-the-art, precast concrete manufacturing site in Pōkeno, Auckland.

Hynds Pinnacle Inspection Chambers and Cesspits are manufactured using a manual wet-casting process, utilizing the latest European and Japanese mould technology to ensure that the product meets strict quality requirements. This process uses high strength, wet-cast concrete batched on-site and controlled curing conditions to provide high quality durable products.

When Hynds developed the state-of-the-art precast concrete manufacturing facility in Pōkeno in 2019, sustainability was front of mind. Rainwater is captured onsite and sent to a holding tank where it is mixed with onsite collected bore water and recovered wastewater from truck and machinery washdowns. This mixed water is used in concrete batching to reduce potable water use, with town supply water only used when there is insufficient recycled water. The on-site treatment of process water reduces the load on municipal infrastructure.

Diagram of Hynds process

System Boundaries

As shown in the table below, this EPD has a scope of cradle-to-gate with options, modules C1-C4, module D and with additional modules (type b). The additional module is A4.

Table 4: ***Modules included in the scope of the EPD***

	Product stage			Construction process stage		Use stage							End of life stage				Recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction / Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential
Modules	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	NZ	NZ	-	-	-	-	-	-	-	-	NZ	NZ	NZ	NZ	NZ
Share of specific data	77%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation: product groups	22%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation: sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X = included in the EPD; ND = Module not declared

**Share of specific data is calculated based on the GWP-GHG results and A1-A3 processes. Energy data (e.g. electricity, LPG) and material data pertaining to primary resource inputs (e.g. concrete, slag, GGBFS, steel) is specific, however data pertaining to the consumables used in manufacturing are not specific. This is consistent across both manufacturing sites.*

Production (Modules A1-A3)

The production stage includes the environmental impacts associated with raw materials extraction and processing of inputs, transport to, between and within the manufacturing site, and manufacturing of average product at the exit gate of the manufacturing site. CO_2 absorption effects due to concrete carbonation during the products' life cycle are not taken into account in any of the declared modules.

Transport to Site (Module A4)

The average transport distance from Hynds Pōkeno manufacturing site to customer sites is 100 km.

End of Life (Modules C1-C4)

When infrastructure reaches the end of its functional life, it is typically demolished and disposed of making way for new infrastructure.Inspection Chambers and Cesspits are a special case since they are typically buried and are often simply abandoned. Other options are for the Inspection Chambers and Cesspits to be exhumed and sent for recycling or exhumed and sent to landfill.

Scenarios shall be realistic and representative of one of the most probable alternatives and shall not include processes or procedures that are not in current use, or which have not been demonstrated to be practical.

This study assumes that the most likely scenario is that the Inspection Chambers and Cesspits will be abandoned. It is not economically feasible to remove and recover Inspection Chambers and Cesspits at the end of their service life. According to Hynds, decommissioned Inspection Chambers and Cesspits are usually left in ground. No additional processes are included at end-of-life to model the decommissioning of a Inspection Chambers and Cesspits.

Recovery and Recycling potential (Module D)

Module D declares a potential credit or burden for the net scrap associated with a recycled product. As theInspection Chambers and Cesspit is modelled as abandoned in the ground there is no credit for concrete or steel recycled.

Default factors from PEF R2 values are therefore not used and are replaced with 0 (European Commission, 2020).

Table 5: End of life scenario and processes, per declared unit (1 kg)

Scenario / Module	Parameter	Left in ground
Deconstruction (C1)	Process and assumptions	n/a
	kg collected	0
Transport (C2)	Process and assumptions	n/a
	kg transported	0
Waste processing (C3)	Process and assumptions	n/a
	kg for re-use	0
	kg for recycling	0
Disposal (C4)	Process and assumptions	n/a
	kg disposed	0

Life Cycle Inventory (LCI) Data and Assumptions

Primary data was used for all manufacturing operations up to the factory gate, including upstream data for general purpose (GP) cement. Primary data were collected based on output data from Hynds systems during July 2023 – June 2024, excluding the sourcing of steel reinforcing wire and mesh which uses 2023 calendar year data.

Background datasets were obtained from Environmental Product Declarations (EPD) specific to suppliers in the case of steel and cement (EPD details omitted because of confidentiality), and EPDs covering similar products i.e. admixtures. All other materials were from the ecoinvent database 3.11 (Wernet, 2016). The reference year for most datasets range from 2019-2024.

Steam curing using natural gas as an energy input, takes place based on the need to turn around a product to fulfill an order. Records associated with steam curing use on a product by product basis is not avaialble. Therefore, natural gas use has been allocated according to the mass of the concrete.

Electricity

Purchased electricity accounts for 100% of electricity use at Pokeno. It has been modelled using the residual electricity mix of the market.

The composition of the residual electricity grid mix of New Zealand is modelled in LCA FE based on published data for the year 1 April 2021 – 31 March 2022 (BraveTrace, 2023). The New Zealand residual electricity mix is made up of hydro (56.6%), geothermal (19.7%) natural gas (12.5%), wind (6.55%), coal (4.25%), biomass (0.266%) and biogas (0.160%).

Onsite consumption (3.00%), and the low voltage (<1kV) grid's transmission and distribution losses (6.73%) are calculated based on data from the Ministry of Business, Innovation & Employment (MBIE, 2023). The emission factor for the New Zealand residual grid mix for the GWP-GHG indicator is 0.151 kg CO2-eq./kWh (based on EF3.1).

Transport

Primary transport data was collected for most input materials to the product. The transport data included the transport modes and distances from suppliers. Transport distances were mapped against each line of Bill of Material (BOM) data and used to calculate upstream transport impacts.

All auxiliary materials and minor input materials were estimated to travel 55 km by truck and be shipped 9 358 km (from Shanghai).

Transport modes:

- Transport, freight, lorry 7.5-16 metric ton, EURO5.

- Transport, freight, sea, container ship.

Cut off criteria

In this study capital goods and infrastructure have been included in the background datasets as provided by ecoinvent (Wernet, 2016). It is not possible, within reasonable effort, to subtract the data on infrastructure/capital goods from these datasets. The results, therefore, of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/ infrastructure in generic datasets, in case infrastructure/ capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

In line with the PCR, personnel-related activities, such as transportation to and from work, are not accounted for in the LCI, while all process related transport are included.

Allocation

It was not possible to discern the specific quantities of energy (natural gas, electricity, diesel), water, consumables, dunnage and wastes per product. Data was available at the site-wide level and is allocated to products.

Mass of concrete is used for allocation:

- Allocation of energy (natural gas, electricity and diesel) is based on mass of concrete per product as concrete production and movement is the main driver for on-site energy consumption.
- Water input is allocated based on mass of concrete as batching is the primary area of water use.
- Inputs and (outputs) such as consumables, dunnage and wastes (data collected at site-wide level) are allocated based on mass of concrete for consistency.

Waste generated by the site are not product specific and hence are allocated per product based on mass allocation (i.e. as a factor of specific product mass and total mass of products manufactured at the facility). Reinforcing steel wire and steel fibres including any steel scrap inputs is based on EPD data. The following allocation process occurred.

- Steel Supplier 1's reinforcing bar and wire co-product allocation is proportioned by physical mass according to EN15804 and ISO14044 guidance. Scrap steel input allocation is unclear and likely to have zero burden applied.
- Steel Supplier 2 did not require co-product allocation as data was provided for individual products. Scrap steel input was modelled with an environmental burden based on economic allocation.
- Steel fibre Supplier has a co-product allocation based on product mass basis (17% of total mass production in the manufacturer's facility). Scrap steel input allocation is unclear and likely to be zero burden.

Noting the above Steel Fibre Supplier and Steel Supplier 1 EPDs, PCR suggests that: "Some LCI databases include datasets that are described as being compliant with the allocation rules of EN 15804, but which have been modelled using cut-off allocation (i.e., waste allocation according to Section 4.5.2) for some production (A1-A3) scrap.... Such datasets can be used without adjustments, if the production scrap has no, negligible, or negative economic value (as co-product allocation then yields the same or nearly the same result as cut-off allocation, see Section 4.5.2) or if it can be justified that co-product allocation is not possible (if so, the use of cut-off allocation shall be declared in the EPD). Otherwise, such datasets shall be adjusted by manually adding an environmental burden in compliance with EN 15804 or as a conservative assumption" (section 4.5.5, (EPD International, 2024)).

In the case of Steel Supplier 1 and Steel Fibre Supplier EPDs (used as inputs for this study), any open scrap inputs into manufacturing remain unknown, and so have been treated as 'burden free.' This is not consistent with the PCR – however, adjusting Steel Supplier 1 and Steel Fibre Supplier EPDs is not possible. As per Section 4.5.2 of the PCR, if it can be justified that co-product allocation is not possible the use of cut-off allocation shall be declared in the EPD.

Explanation of Representative Products & Variation

This is an EPD of multiple products, based on a representative product.. The representative product is closest to or matches the sales-weighted average GWP-GHG impacts of the product group. The variation between individual products in the group is up to 22% for modules A1-A3, for the GWP-GHG indicator.

RESULTS

Assessment Indicators

The results tables describe the different environmental indicators for each product per declared unit, for each declared module. The EN 15804 reference package based on EF 3.1 has been used.

The first section of each table contains the environmental impact indicators, describing the potential environmental impacts of the product as shown in Table 11. The second section shows the resource indicators, describing the use of renewable and non-renewable material resources, renewable and non- renewable primary energy and water, as shown in Table 12. The final section of each table displays the waste and other outputs, as shown in Table 13.

The use of primary energy is separated into energy used as raw material and energy used as energy carrier as per option C in Annex 3 of the PCR (EPD International 2024).

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. Energy indicators (MJ) are always given as net calorific value.

Table 6: Indicators for life cycle impact assessment

Impact category	Indicator	Unit
Climate change – total	GWP-total	kg CO_2-eq.
Climate change – fossil	GWP-fossil	kg CO_2-eq.
Climate change – biogenic	GWP-biogenic	kg CO_2-eq.
Climate change – land use and land use change	GWP-luluc	kg CO_2-eq.
Ozone depletion	ODP	kg CFC-11 eq.
Acidification	AP	Mole of H+ eq.
Eutrophication aquatic freshwater	EP-freshwater	kgP eq.
Eutrophication aquatic marine	EP-marine	kgN eq.
Eutrophication terrestrial	EP-terrestrial	Mole of N eq.
Photochemical ozone formation	POCP	kgNMVOC eq.
Depletion of abiotic resources – minerals and metals[1,2]	ADP-m&m	kgSb eq.
Depletion of abiotic resources – fossil fuels[1]	ADP-fossil	MJ
Water use[1]	WDP	m^3 world equiv.

Table 7: Life cycle inventory indicators on use of resources

Indicator	Abbreviation	Unit
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ
Use of renewable primary energy resources used as raw materials	PERM	MJ
Total use of renewable primary energy resources	PERT	MJ
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ
Total use of non-renewable primary energy resources	PENRT	MJ
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Total use of net fresh water	FW	m^3

Table 8: Life cycle inventory indicators on waste categories and output flows

Indicator	Abbreviation	Unit
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Components for reuse	CRU	kg
Materials for energy recovery	MER	kg
Materials for recycling	MFR	kg
Exported electrical energy	EEE	MJ
Exported thermal energy	EET	MJ

Table 9: Biogenic carbon content indicators

Indicator	Abbreviation	Unit
Biogenic carbon content - product	BCC-prod	kg
Biogenic carbon content - packaging	BCC-pack	kg

Table 10: Additional Environmental Impact Indicators

Indicator	Abbreviation	Unit
Climate Change[3]	GWP-GHG	kg CO_2-eq.
Particulate Matter emissions	PM	Disease incidences
Ionising Radiation – human health[4]	IRP	kBq U235 eq.
Eco-toxicity (freshwater)[5]	ETP-fw	CTUe
Human Toxicity, cancer[5]	HTP-c	CTUh
Human Toxicity, non-cancer[5]	HTP-nc	CTUh
Land use related impacts / soil quality[5]	SQP	Dimensionless

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

[2]The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/ infrastructure in generic datasets, in case infrastructure/ capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

[3] This indicator should be identical to GWP-total except that the CF for biogenic CO2 is set to zero. It has been included in the EPD following the PCR (EPD International, 2024). In this study, it is calculated by subtracting the value of Climate change – biogenic (GWP-biogenic) from the value of Climate change – total (GWP-total) since the ecoinvent Excel LCIA results do not include the indicator.

[4] 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.

[5] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

Environmental performance per 1 kg of Hynds Pinnacle Precast Concrete Inspection Chambers and Cesspits

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 11: Core environmental indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D	A-C
GWP-total	kg CO_2-eq.	2.31E-01	2.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32.2%
GWP-fossil	kg CO_2-eq.	2.31E-01	2.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32.1%
GWP-biogenic	kg CO_2-eq.	5.53E-04	1.20E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	24.8%
GWP-luluc	kg CO_2-eq.	2.05E-04	1.12E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	28.9%
ODP	kg CFC11-eq.	4.22E-09	3.15E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.25%
AP	Mole of H+ eq.	1.35E-03	8.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	21.6%
EP-freshwater	kg P eq.	1.26E-04	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	26.2%
EP-marine	kg N eq.	2.54E-04	2.64E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	23.0%
EP-terrestrial	Mole of N eq.	3.79E-03	2.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17.4%
POCP	kg NMCOC eq.	4.62E-03	1.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.13%
ADP-m&m	kg Sb-eq.	3.06E-07	8.60E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	19.1%
ADP-fossil	MJ	1.74E+00	3.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	24.7%
WDP	m^3 world eq.	1.97E-01	1.77E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.96%

Table 12: Resource use indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	3.77E+00	5.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERM	MJ	2.14E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	5.91E+00	5.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRE	MJ	1.70E+00	3.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRM	MJ	2.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	1.72E+00	3.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	kg	5.81E-02	1.46E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	6.01E-03	1.77E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	5.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.06E-02	4.49E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

The results for A1-A3 should not be analysed without considering the impacts represented by module C.

Table 13: Waste output flow indicators

Waste and output flows	Unit	A1-A3	A4	C1	C2	C3	C4	D
HWD	kg	9.89E-03	7.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	1.39E-01	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RWD	kg	3.13E-06	2.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 14: Additional indicators

Waste and output flows	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-GHG	kg CO_2-eq.	2.31E-01	2.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PM	Disease incidences	1.75E-08	1.73E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IRP	kBq U235 eq.	3.24E-03	2.84E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETP-fw	CTUe	6.40E-01	6.94E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HTPc	CTUh	2.83E-10	4.06E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HTPnc	CTUh	8.73E-09	2.04E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SQP	Pt	7.42E-02	1.77E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 15: Biogenic carbon indicators

Indicators	Units	A1 - A3
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

WEIGHT CONVERSION TABLE

Table 16: Pinnacle Precast Concrete Inspection Chambers and Cesspits products covered by this EPD and their weights for conversion.

Product code	Product full name	Product mass (kg per 1 unit of pipe)	Representative product
CP300300	Cesspit Conc 300Lx300Wx610Hmm Mini	161	
CP370300FT	Cesspit Conc 370Lx300Wx1585Hmm Flat Top Mano	1 502	
CP450300	Cesspit Conc 450Lx300Wx700Hmm	209	
CP450450	Cesspit Conc 450Lx450Wx950Hmm	559	
CP675450BE	Cesspit Conc 675Lx450Wx1200Hmm Back Entry	658	
CP675450FT	Cesspit Conc 675Lx450Wx1200Hmm Flat Top	894	
CP675450FT9	Cesspit Conc 675Lx450Wx900Hmm Flat Top	493	
CP675450SBE	Cesspit Syphon Conc 675Lx450Wx1800Hmm Back Entry	850	
CP675450SFT	Cesspit Syphon Conc 675Lx450Wx1800Hmm	859	
CP800500CHA	Catchpit Channel Conc 1200Lx400Wmm TypeA cw Cut Out	152	
CP800500CHB	Catchpit Channel Conc 1200Lx400Wmm Type B	210	
CP800500FT	Cesspit Conc 800Lx500Wx1800Hmm Flat Top	1 334	
CP800500FT1.5	Cesspit Conc 800Lx500Wx1500Hmm Flat Top	1 164	
CP800500KBS	Kerb Block Conc 2400Lx300Wmm Type S	508	
CP800500KBVS	Kerb Block Conc 1200Lx300Wmm Type VS	290	
CP800500SBE	Catchpit Channel Conc 800Lx500Wx1800Hmm Back Entry	1 334	
CP845150	Kerb Block Conc 845x150mm Back Inlet	48	
CP845170	Kerb Block Conc 845Lx170H Back inlet	54	
CP845200	Kerb Block Conc 845Lx200H mm Back inlet	67	
CP900	Cesspit Conc Backing block standard type	59	
CPB6754500900M	Catchpit Back Entry Conc 675Lx450Wx900Hmm Pinnacle	508	
CPB6754501200M	Catchpit Back Entry Conc 675Lx450Wx1200Hmm Pinnacle	672	
CPB6754501650M	Catchpit Back Entry Conc 675Lx450Wx1650Hmm Pinnacle	907	
CPF6754500900M	Catchpit Flat Top Conc 675Lx450Wx900Hmm Pinnacle	521	
CPF6754501200M	Catchpit Flat Top Conc 675Lx450Wx1200Hmm Pinnacle	684	
CPF6754501650M	Catchpit Flat Top Conc 675Lx450Wx1650Hmm Pinnacle	917	
CPR450450100M	Catchpit Riser Conc 450Lx450Wx100Hmm Pinnacle	75	

CPR450450150M	Catchpit Riser Conc 450Lx450Wx150Hmm Pinnacle	109	Yes
CPR450450300M	Catchpit Riser Conc 450Lx450Wx300Hmm Pinnacle	214	
CPR675450100M	Catchpit Riser Conc 675Lx450Wx100Hmm Pinnacle	84	
CPR675450150M	Catchpit Riser Conc 675Lx450Wx150Hmm Pinnacle	123	
CPR675450300BEM	Catchpit Riser Conc 675Lx450Wx300Hmm Back Entry Pinnacle	260	
CPR675450300M	Catchpit Riser Conc 675Lx450Wx300Hmm Pinnacle	254	
CR4504501	Cesspit Riser Conc 450Lx450Wx100Hmm	59	
CR4504501.5	Cesspit Riser Conc 450Lx450Wx150Hmm	87	
CR6754501.5	Cesspit Riser Conc 675Lx450Wx150Hmm	75	
CR6754503	Cesspit Riser Conc 675Lx450Wx300Hmm	132	
ICF60060015M	IC Flange Base & Riser Conc Ø600x0600Hx150Bmm Pinnacle	419	
ICF60060015W	IC Flange Base & Riser Conc Ø600x0600Hx150Bmm Pinnacle	431	
ICF60090015M	IC Flange Base & Riser Conc Ø600x0900Hx150Bmm Pinnacle	487	
ICF60090015W	IC Flange Base & Riser Conc Ø600x0900Hx150Bmm Pinnacle	499	
ICF60120015M	IC Flange Base & Riser Conc Ø600x1200Hx150Bmm Pinnacle	554	
ICF60120015W	IC Flange Base & Riser Conc Ø600x1200Hx150Bmm Pinnacle	566	
ICF60180015W	IC Flange Base & Riser Conc Ø600x1800Hx150Bmm Pinnacle	697	
ICF67060015M	IC Flange Base & Riser Conc Ø675x0600Hx150Bmm Pinnacle	500	
ICF67060015W	IC Flange Base & Riser Conc Ø675x0600Hx150Bmm Pinnacle	504	
ICF67090015M	IC Flange Base & Riser Conc Ø675x0900Hx150Bmm Pinnacle	582	
ICF67090015W	IC Flange Base & Riser Conc Ø675x0900Hx150Bmm Pinnacle	586	
ICF67120015M	IC Flange Base & Riser Conc Ø675x1200Hx150Bmm Pinnacle	664	
ICF67120015W	IC Flange Base & Riser Conc Ø675x1200Hx150Bmm Pinnacle	668	
ICF90060015W	IC Flange Base & Riser Conc Ø900x0600Hx150Bmm Pinnacle	769	
ICF90090015W	IC Flange Base & Riser Conc Ø900x0900Hx150Bmm Pinnacle	904	
ICF90120015W	IC Flange Base & Riser Conc Ø900x1200Hx150Bmm Pinnacle	1 029	
ICI60060015M	IC Internal Base & Riser Conc Ø600x0600Hx150Bmm Pinnacle	265	
ICI60090015M	IC Internal Base & Riser Conc Ø600x0900Hx150Bmm Pinnacle	334	
ICI60180015M	IC Internal Base & Riser Conc Ø600x1800Hx150Bmm Pinnacle	536	
ICI67060015W	IC Internal Base & Riser Conc Ø675x0600Hx150Bmm Pinnacle	299	

ICI67090015W	IC Internal Base & Riser Conc Ø675x0900Hx150Bmm Pinnacle	380	
ICI67120015W	IC Internal Base & Riser Conc Ø675x1200Hx150Bmm Pinnacle	463	
ICI90060015W	IC Internal Base & Riser Conc Ø900x0600Hx150Bmm Pinnacle	491	
ICI90090015W	IC Internal Base & Riser Conc Ø900x0900Hx150Bmm Pinnacle	621	
ICI90120015W	IC Internal Base & Riser Conc Ø900x1200Hx150Bmm Pinnacle	751	
ICL090200HD6HCW	IC Lid Conc Ø900 200Hmm HD Ø605 HC Pinnacle	380	
ICL60055CLW	IC Lid Conc Ø600 55Hmm 1.5kPa Closed Pinnacle	69	
ICL60100PCLW	IC Lid Conc Ø600 100Hmm 5kPa Closed Pinnacle	122	
ICL67100PCLW	IC Lid Conc Ø675 100Hmm 5kPa Closed Pinnacle	148	
ICL90100PCLW	IC Lid Conc Ø900 100Hmm 5kPa Closed Pinnacle	276	
ICL90150LD5HCW	IC Lid Conc Ø900 150Hmm LD20 Ø535 HC Pinnacle	257	
ICL90200HD6HCW	IC Lid Conc Ø900 200Hmm HD60 Ø605 HC Pinnacle	350	
ICR450600M	IC Riser Conc Ø450x0600Hmm Pinnacle	89	
ICR450900M	IC Riser Conc Ø450x0900Hmm Pinnacle	90	
ICR600300M	IC Riser Conc Ø600x0300Hmm Pinnacle	69	
ICR600450M	IC Riser Conc Ø600x0450Hmm Pinnacle	101	
ICR600600M	IC Riser Conc Ø600x0600Hmm Pinnacle	136	
ICR600900M	IC Riser Conc Ø600x0900Hmm Pinnacle	203	
ICR601200M	IC Riser Conc Ø600x1200Hmm Pinnacle	271	
ICR601800M	IC Riser Conc Ø600x1800Hmm Pinnacle	407	
ICR670300M	IC Riser Conc Ø675x0300Hmm Pinnacle	83	
ICR670450M	IC Riser Conc Ø675x0450Hmm Pinnacle	123	
ICR670600M	IC Riser Conc Ø675x0600Hmm Pinnacle	165	
ICR670900M	IC Riser Conc Ø675x0900Hmm Pinnacle	247	
ICR671200M	IC Riser Conc Ø675x1200Hmm Pinnacle	330	
ICR900300M	IC Riser Conc Ø900x0300Hmm Pinnacle	129	
ICR900600M	IC Riser Conc Ø900x0600Hmm Pinnacle	258	
ICR900900M	IC Riser Conc Ø900x0900Hmm Pinnacle	387	

ICR901200M	IC Riser Conc Ø900x1200Hmm Pinnacle	519	
LD0600050CN	IC Lid Conc Ø600 50Hmm North Closed Rebated	47	
LD0600075C	IC Lid Conc Ø600 75Hmm Closed Rebated	72	
LD0675075N	IC Lid Conc Ø675 75Hmm Ø530 Hole Rebated North	59	

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General information

Declaration owner:	**Hynds Pipe Systems Ltd** Jackson MacFarlane, jackson.macfarlane@hynds.co.nz www.hynds.co.nz Sustainability@hynds.co.nz PO Box 58142, Botany, Auckland 2163
Geographical scope	New Zealand
Reference year for data	July 2023 - June 2024
LCA produced by:	**thinkstep Ltd.** Barbara Nebel, thinkstep Ltd. Rosie Dodd, thinkstep Ltd. Joel Edwards, thinkstep Ltd. www.thinkstep-anz.com | anz@thinkstep-anz.com 11 Rawhiti Road, Pukerua Bay, Wellington 5026, New Zealand
EPD programme operator:	**EPD International AB** www.environdec.com Box 210 60, SE-100 31, Stockholm, Sweden info@environdec.com
Regional programme:	**EPD Australasia Limited** www.epd-australasia.com info@epd-australasia.com 315a Hardy Street, Nelson 7010, New Zealand
CEN standard EN 15804+A2 served as the core PCR	
PCR:	PCR 2019.14 Construction Products, version 1.3.4 (published on 2024-04-30, valid until 2025-06-20) c-PCR-003 (to 2019:14) Concrete and concrete elements, version 1.0.0 (published on 2025-04-08)
PCR review was conducted by:	The Technical Committee of the International EPD System. See www.environdec.com for a list of members.
Chair:	The most recent review chair: Claudia Peña, PINDA LCT SpA. The review panel may be contacted via the Secretariat: www.environdec.com/contact
Independent third-party verification of the declaration and data, according to ISO 14025:	☑ EPD verification (by individual verifier)
Third-party verifier: (Approved by: EPD Australasia)	Claudia A. Peña, PINDA LCT SpA Email: pinda.lct@gmail.com
Procedure for follow-up of data during EPD validity involved third-party verifier	❑ Yes ☑ No

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