EPD
INTERNATIONAL EPD SYSTEM

CONSTRUCTION OF LEVEES, DYKES AND EMBANKMENTS

PRODUCT GROUP CLASSIFICATION: UN CPC 5323

C-PCR-038 (TO PCR 2019:14)
VERSION: 1.0.0

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1 INTRODUCTION

1.1 GENERAL

This document constitutes complementary Product Category Rules (c-PCR) developed in the framework of the International EPD System: a programme for Environmental Product Declarations (EPD)[1] according to ISO 14025, ISO 14040, ISO 14044, and product-specific standards such as EN 15804, EN 15941 and ISO 21930 for construction products.[2] EPDs are voluntary documents for a company or organisation to present transparent, consistent and verifiable information about environmental performance of their product (goods or services).

The General Programme Instructions (GPI), publicly available on www.environdec.com, includes the rules for the overall administration and operation of the programme and the basic rules for developing EPDs registered in the programme. PCRs and c-PCRs complement the GPI and the normative standards by providing specific rules and guidelines for developing an EPD for one or more specific product categories (see Figure 1). A PCR/c-PCR should enable different practitioners using the PCR/c-PCR to generate consistent results when assessing products of the same product category.

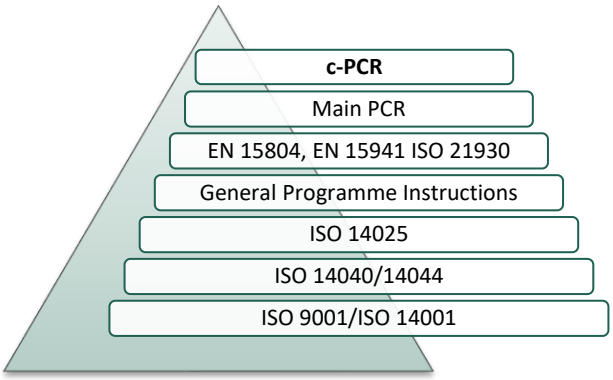

Figure 1. This c-PCR in relation to the hierarchy of standards and other documents.

The present c-PCR uses the following terminology:

- The term “shall” is used to indicate what is obligatory, i.e., a requirement.
- The term “should” is used to indicate a recommendation. Any deviation from a recommendation shall be justified in the EPD development process.
- The terms “may” or “can” are used to indicate an option that is permissible.

For definitions of further terms used in the document, see the GPI, the main PCR, and the normative standards.

A main PCR and its c-PCRs are valid for a pre-determined period of time to ensure that it is updated at regular intervals. The latest version of the PCR and its c-PCRs are available on www.environdec.com. Stakeholder feedback on PCRs and c-PCRs is very much encouraged. Any comments on this c-PCR may be sent directly to the PCR Moderator and/or the Secretariat during its development or during its period of validity.

Any references to this document shall include the PCR registration number, name and version.

The programme operator maintains the copyright of the PCR to ensure that it is possible to publish, update, and make it available to all organisations to develop and register EPDs. Stakeholders participating in PCR development should be acknowledged in the final document and on the website.

[1] Termed type III environmental declarations in ISO 14025.

[2] When standards are referred to in this document, the version listed in Section **Error! Reference source not found.** is intended unless otherwise s tated.

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1.2 ROLE OF THIS DOCUMENT

This c-PCR complements the main PCR of construction products in the International EPD System, PCR 2019:14 Construction products, available on www.environdec.com. The c-PCR cannot be used by itself but shall be used together with PCR 2019:14, and EN 15804 and EN 15941, for products within the scope of the PCR (see Section 2.2.1). It is required to use an applicable c-PCR after it has been published 90 days. It is optional to the use the c-PCR if it has been published for less than 90 days.

If more than one c-PCR is applicable, the EPD owner may choose to use any of them, but it is recommended to use the one that is more specific in scope in terms of product function. An alternative is to use, and verify the EPD towards, several applicable c-PCRs, as long as there are no conflicting requirements in the c-PCRs.

If requirements in the main PCR and the c-PCR are in conflict, the requirements in the c-PCR take precedence over those in the main PCR.

See Figure 2 for an illustration on how PCR 2019:14 and this c-PCR relate to each other and the EPDs that may be based on them.

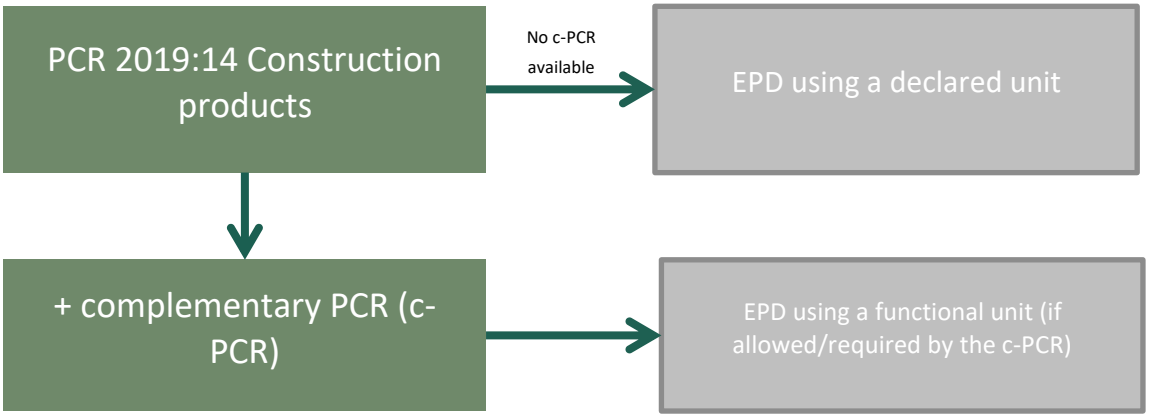

Figure 2. Overview of how PCR 2019:14 can be used directly, or together with a c-PCR, to develop an EPD. An EPD that uses a functional unit shall be based on a c-PCR. An EPD based on a declared unit can be developed without a c-PCR.

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2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	Construction of Levees, dykes and embankments
Registration number and version:	c-PCR-038, version 1.0.0
Programme:	EPD INTERNATIONAL EPD SYSTEM
Programme operator:	EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden. Website: www.environdec.com E-mail: support@environdec.com
PCR Moderator:	Peter Chia-Pan Chen, ITRI - peter_chen@itri.org.tw Jose Daniel Tapia Galvan, ITRI - danielt@itri.org.tw
PCR Committee:	Industrial Technology Research Institute (ITRI) Tsai-Chi KUO, National Taiwan University of Science and Technology Chi-Yu TIN, Hying Sustainable Development Technology Co., Ltd. (環穎永續發展科技股份有限公司) Chao-Chin HSU, Water Resources Agency, MOEA Taiwan
Publication date	2026-05-07 See Section 9 for a version history of the c-PCR.
Valid until:	2030-05-07 The validity may change. See www.environdec.com for the latest version of the PCR and the latest information on its validity and transition periods between versions.
Development and updates.	The c-PCR has been developed following ISO 14027, including public consultation and review. The rules for the development and updating processes are described in Section 9 of the GPI. The c-PCR is valid for a pre-determined time period to ensure that it is updated at regular intervals. When the c-PCR is about to expire, the PCR Moderator shall initiate a discussion with the Secretariat on if and how to proceed with updating the c-PCR and renewing its validity. A c-PCR may be updated before it expires, based on changes in normative standards or provided significant and well-justified proposals for changes or amendments are presented. When there has been an update of the c-PCR, the new version should be used to develop EPDs. For small updates (change of third-digit version number), the previous version is normally immediately removed from the PCR library on www.environdec.com and there is no transition period. For medium updates (change of second-digit version number), the previous version of the c-PCR is valid in parallel during a transition period of at least 90 days, but not exceeding its previously set validity period. For large updates (change of first-digit version number), the previous version is valid in parallel during a transition period of at least 180 days, but not exceeding its previously set validity period. In case a c-PCR is developed by a CEN Product TC, the standard will replace this c-PCR, with a transition period of at least 90 days under which both are valid.

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	Stakeholder feedback on PCRs is very much encouraged. Any comments on this c-PCR may be sent directly to the PCR Moderator and/or the Secretariat during its development or during its period of validity.
Standards documents and conformance:	▪ General Programme Instructions of the International EPD System, version 5.0.0, based on ISO 14025 and ISO 14040/14044.3 ▪ EN 15804:2012+A2:2019/AC:2021 ▪ EN 15941:2024 ▪ ISO 21930:2017. This standard is used in selected sections, such as allocation, when it provides additional but not contradictory rules to EN 15804. EPDs may comply with this standard if additional requirements are met, see Section 1.5. ▪ ASCE 24-14: "Flood Resistant Design and Construction" ▪ Water Resources Engineering Technical Specifications - River Management Volume (Parts I & II), 102nd Year of the Republic of China, Ministry of Economic Affairs, Water Resources Agency. ▪ ISO 14040:2006 "Environmental management-Life Cycle Assessment-Principles and framework" ▪ ISO 14044:2006 "Environmental management- Life Cycle Assessment- Requirements and guidelines" ▪ CIRIA; Ministry of Ecology (France); & U.S. Army Corps of Engineers. (2013). The International Levee Handbook (C731). London: CIRIA. ISBN 978 0 86017 734 0 ▪ ISO 14025:2006 "Environmental labels and declarations" ▪ ECO Platform standards, versions published 2024-12-20[4,5] If PCR 2019:14 refers to a later version of any of the above standards, the later version applies.
PCR language(s):	At the time of publication, this c-PCR was available in English. If the c-PCR is available in several languages, these are available on www.environdec.com. In case of translated versions, the English version takes precedence in case of any discrepancies.

2.2 SCOPE

2.2.1 PRODUCT CATEGORY DEFINITION AND DESCRIPTION PCR

This document provides complimentary Product Category Rules (c-PCR) for the assessment of the environmental performance of the **service of construction of Levees, Dykes and Embankments** and the declaration of this performance by an EPD. The product category corresponds to UN CPC: 532234 Irrigation and flood control waterworks.

[3] Some rules influencing EPD development are independent of the GPI version referred to in the PCR. For example, the latest rules on EPD verification procedures in the GPI shall be followed within 90 days of its publication. See Section 5.1 in the GPI for a description of the four categories of rules and when they shall be followed.

[4] The ECO Platform standards consist of several documents, see footnote 5, whereof the LCA Calculation Rules and Digital Data Requirements are specifically relevant for this PCR. All requirements in the ECO Platform Standards that are additional to EN 15804 and EN 15941, are repeated in this PCR. Therefore, EPD developers and verifiers do not need check the LCA Calculation Rules, Digital Data Requirements, or other documents of the ECO Platform standards.

[5] The following versions of the ECO Platform standards were published 2024-12-20: General Remarks v1.2, LCA Calculation Rules v2.0, Tool Verification Guidelines v1.1, Digital Data Requirements v1.1, Requirements for publishing digital data in ECO Portal v1.0, Quality Management Guidelines v2.0, Audit Guidelines v1.1, Audit Requirements v2.0.

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A levee is a composite hydraulic structure designed mainly to function as a flood defence system by providing a continuous barrier to prevent or redirect flow of water from rivers, lakes, water bodies or storm surges. It would generally operate under hydrostatic or hydrodynamic conditions.

This c-PCR intends to address infrastructure elements related to water flow control, flood prevention and tide protection. Particularly, referring to “Levee” or embankments.

The products that are related to this c-PCR are the following: river levees, sea levees, floodwalls, slopes and supporting facilities such as drainage channels and relief canals. Synonyms for levees include dykes (or dikes), embankments, flood banks, seawalls, and floodwalls.

The UN CPC classification hierarchy is as follows:

- Section: 5 - Constructions and construction services
- Division: 53 - Constructions
- Group: 522 - Civil engineering works
- Class: 5223 - Harbours, waterways, dams, irrigation and other waterworks
  - Subclass: 52234 - **Irrigation and flood control waterworks**

For further information related to UN CPC please refer to https://unstats.un.org/unsd/classifications/Family/Detail/1074.

2.2.2 TYPE OF EPD AND INFORMATION MODULES INCLUDED

See PCR 2019:14

Following the requirements in Section 2.2.2 of PCR 2019:14, an EPD based on this c-PCR shall be a type f) Construction service EPD (Cradle to gate) EPD, including A1-A3, A4-A5 as mandatory modules. Section 4.3 provides more rules on the system boundaries.

2.2.3 GEOGRAPHICAL SCOPE

This c-PCR may be used globally.

2.2.4 EPD VALIDITY

See PCR 2019:14.

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3 PCR REVIEW AND BACKGROUND INFORMATION

This c-PCR was developed in accordance with the PCR development process described in the GPI of the International EPD® System, including open consultation and review.

3.1 OPEN CONSULTATION

3.1.1 VERSION 1.0.0, 2026-05-07

This c-PCR was available for open consultation from 2025-07-17 until 2025-09-12, during which any stakeholder was able to provide comments by contacting the PCR Moderator and/or the Secretariat.

Stakeholders were invited via e-mail or other means to take part in the open consultation and were encouraged to forward the invitation to other relevant stakeholders. None of the stakeholders who provided comments during the open consultation agreed to be listed as contributors in the c-PCR and on www.environdec.com.

3.2 PCR REVIEW

3.2.1 VERSION 1.0.0, 2026-05-07

PCR review panel:	The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR Committee, and if there were conflicts of interest they were excused from the review.
Chair of the PCR review:	Barbara Civit
Review dates:	2025-10-13 to 2025-12-08

3.3 EXISTING PCRS FOR THE PRODUCT CATEGORY

As part of the development of this c-PCR, existing PCRs and c-PCRs and other internationally standardised methods that could potentially act as c-PCRs for the product category in scope, were considered to avoid unnecessary overlaps in scope and to ensure harmonisation with established methods of relevance for the product category. The existence of such documents was checked among the following EPD programmes and international standardisation bodies:

- International EPD System. www.environdec.com.
- PCR Committee reviewed PCRs availability in other Programme Operators such as: ULSolutions, IBU, EPDItaly, EPDNorge, NSF International.

The PCR Committee identified a main PCR under development by EPDItaly under the name Flood control waterworks.

Table 1 lists the identified PCRs and other standardised methods.

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Table 1. Existing PCRs and other internationally standardised methods that were considered to avoid overlap in scope and to ensure harmonisation with established methods.

Name of PCR/standard, incl. registration number	Programme/standardisation body	Version number/date of publication	Scope
Flood control waterworks	EPDItaly	Version 1 2025/10/23	Broader products beyond a single construction product

3.4 REASONING FOR DEVELOPMENT OF C-PCR

This c-PCR was developed to provide rules and guidance additional to those in PCR 2019:14 and EN 15804, for developing EPDs for the product category. The c-PCR thereby enables different practitioners to generate consistent results when assessing the environmental impact of the service of construction products of the same product category under equivalent design specifications and declared service life. thereby supporting comparability of products within a product category.

It is considered relevant to develop this c-PCR due to the technical relevance and potential market need. The development of this c-PCR targets primarily, but not exclusively, the AEC (architecture, engineering and construction) sector, with applications in public infrastructure as well. This c-PCR intends to primarily target a construction product such as levees.

3.5 UNDERLYING STUDIES USED FOR C-PCR DEVELOPMENT C-PCR

The methodological choices made during the development of this c-PCR (declared/functional unit, system boundary, allocation methods, impact categories, data quality rules, etc.) were primarily based on the following underlying studies:

Hasan, R., McPhillips, L. M., Warn, G. P., & Bilec, M. M. (2024). **Life cycle assessment of green–grey coastal flood protection infrastructure: A case study from New Orleans**. *Environmental Research: Infrastructure and Sustainability, 39*(1). https://doi.org/10.1088/2634-4505/ad3578

4 LCA METHOD

This section provides rules for the LCA method used to develop an EPD for the product category as defined in Section 2.2.1.

4.1 MODELLING APPROACH

See PCR 2019:14.

4.2 FUNCTIONAL UNIT

The functional unit is defined as a quantitative performance measure of a product system for reference usage according to EN 15804. The functional unit will serve to define performance characteristics of the product category covered by this c-PCR in accordance to the main PCR.

The functional unit for this product category in this PCR is defined as one meter of a levee, dyke or embankment constructed according to a defined standard cross-sectional geometry measured in a finished state expressed in square meters including auxiliary facilities.

EPDs developed using this c-PCR may be compared only where the levees, dykes or embankments are designed according to system boundaries and an equivalent declared service life laid out in this document

A description of levees, dykes or embankments' dimensions, cross-sectional area and declared assumptions shall be stated in the EPD.

Descriptions of the levee's longitudinal dimensions and specific functionality characteristics must be stated and included. Further technical specifications are included in section 4.2.3 that shall be referred to.

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Table 2.Type of EPD, life cycle stages included and functional unit under this PCR scope

Type of EPD	Life Cycle Stages	Unit	
f) Construction service EPD (Cradle to gate)	A1-A5 and optional modules	Functional Unit	As one meter of levee, dyke or embankment construction, with a standard cross-sectional area, including auxiliary facilities, designed for a 100-year reference service life and comparable for identical design, system boundaries and declared service life products.

4.2.1 REFERENCE SERVICE LIFE (RSL)

See PCR 2019:14.

As for this c-PCR, Reference Service Life (RSL) refers to the service life of a product which in this case can be a levee, dyke or embankment. Aligning with the Functional Unit of this c-PCR, the RSL shall be based on a 100-year lifespan, serving as a base calculation for maintenance and renovation of the given construction or infrastructure product covered by the scope of this c-PCR.

4.2.2 PRODUCT LIFESPAN

Not relevant

4.2.3 TECHNICAL SPECIFICATION

As per standard requirements for elements in a levee, dyke and embankments this PCR considers that the following elements shall be included according to the specifications wherever relevant.

Table 3.Technical reference elements for levees, dykes and embankments

Element	Description
Crest	Top surface or crown of the levee provides a horizontal surface.
Earth fill	Common in levees. Main volumetric component of a levee typically made of granular or soil material.
Waterside	Side of the levee facing the water body.
Landside	Side of the levee facing the land or faces away from the water body.
Foundation	A facility installed at the base of a levee to support the levee structure and prevent sliding or settling
Slope Protection	Protective structures designed to safeguard riverbanks and stabilize slopes from water erosion
Stand/Berm	A feature installed midway on the slope of a levee, particularly for tall levees, to prevent slope collapse and facilitate construction, flood prevention, and emergency rescue

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Working Platform	When a levee is excessively high, this facility is installed at the mid-slope of the revetment to prevent slope collapse, facilitate construction, and support flood control and emergency response operations.
Floodwall	A vertical structure designed to prevent water intrusion, stabilize riverbanks, and protect coastlines
Groyne	A structure extending from the riverbank toward the river center, used to trap sediment, create sandbars, direct water flow, or protect riverbanks
Revetments	A protective structure installed downstream of a hydraulic structure to prevent severe scouring of the riverbed.
Water Gate	A controllable gate installed on a levee to regulate and manage the inflow and outflow of water
Flood Protection Road	Roads built to facilitate flood control and emergency rescue transportation
Drainage Facility	Infrastructure designed to channel rainwater, reduce surface water accumulation, and prevent erosion of flood protection roads
Consolidation work	Protective structures designed to prevent riverbeds from erosion and scouring caused by water flow
Energy dissipators	Energy dissipation structures are engineering facilities designed to reduce excessive flow energy and protect downstream channels and hydraulic works.
Other Temporary Facilities	Miscellaneous facilities managed by the engineering department
Auxiliary facilities	Necessary facilities to ensure the integrity of the infrastructure

The longitudinal dimensions, cross-sectional areas or geometry of a levee product obeys the nature of the project, location and application.

4.3 SYSTEM BOUNDARY

Aligning with PCR 2019:14, EPDs that are developed based on this c-PCR shall cover according to the scope and functional unit:

Type f) EPD: product stage (A1-A3), and construction process stage (A4-A5) and optional modules.

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Table 4.*Life cycle stages, information modules, and the requirements for inclusion for type f EPD developed under this c-PCR.*

Life Cycle Stages	Information module		Type of EPD f) Construction service EPD: Cradle to gate with modules A1-A5 and optional modules
A1-A3 Product stage	A1	Raw material supply	Mandatory
	A2	Transport	
	A3	Manufacturing	
A4-A5 Construction stage	A4	Transport	Mandatory
	A5	Construction	Mandatory
B Use stage	B1	Use	Optional
	B2	Maintenance	
	B3	Repair	
	B4	Replacement	
	B5	Refurbishment	
	B6	Energy use	
	B7	Water use	
C End of life stage	C1	Deconstruction	Optional
	C2	Transport	
	C3	Waste processing	
	C4	Disposal	
D Benefit and loads beyond the system boundary	D	Reuse, recovery, recycling potential	Optional

The following subsections describe the covered information modules, respective processes, and other rules on the setting of system boundary. For detailed information on each module, see EN 15804 (Section 6.3.5). Here only specific descriptions related to this c-PCR are provided. The scope of this c-PCR aims to cover modules A1-A3 and A4-A5 as mandatory and Modules B, Modules C and Modules D as optional. This c-PCR intends to be a guideline for EPDs aimed to the construction stages of a levee, dyke or embankment. However, the scope can be expanded to subsequent modules as per the practitioner's requirements.

4.3.1 PRODUCT STAGE: MODULES A1-A3

See PCR 2019:14 and Section 6.3.5.2 of EN 15804.

As for the product stage, the following shall be included:

- **Module A1:** Raw material extraction and processing. Module A1 will include the processing of secondary materials as well.
- **Module A2:** Raw material transportation to the manufacturer for production of construction elements e.g., gabions, steel rebars, cement, concrete, and others
- **Module A3:** Production of materials and elements used for the construction of a levee such as gabions, steel rebars, cement, gravel, asphalt and other relevant materials.

This list is a non-exhaustive set of examples for the product stage, meaning that other product stage processes can be included if relevant.

The product stage processes shall not include:

- Services related to personnel (on-site offices, sanitary services, transport)

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- Research and development activities.
- Machinery production

4.3.2 CONSTRUCTION PROCESS STAGE: MODULES A4-A5

See PCR 2019:14 and Section 6.3.5.3 of EN 15804.

Regarding the Construction stage, the following shall be included:

- **Module A4**. this module includes the transportation of products to the construction site ready for use.
- **Module A5.** construction of the infrastructure which shall include:
  - Clearing and grubbing existing trees, vegetation activities and removal of existing decommissioned infrastructure products. These activities for example can include clearing trees, brush and removal of decommissioned infrastructure located on the site.
  - Ground works and earthworks
  - Construction process related to the composition of the main parts and components of the infrastructure
  - Construction of foundation
  - Installation of temporary facilities include, but are not limited to, construction access roads and temporary earthwork storage.
  - Construction of slope protection, floodwall, aprons, groin, flood gates, drainage facilities.
  - Water supply and energy consumption related to the construction process.
  - Includes any direct and indirect emission related to the construction process.
  - This module considers the inclusion of transportation and waste treatment generated during the construction process.

4.3.3 USE STAGE: MODULES B1-B7

See PCR 2019:14 and EN 15804 if declared.

4.3.4 END OF LIFE: MODULES C1-C4, D

See PCR 2019:14 and EN 15804 if declared.

4.4 CUT-OFF RULES

See PCR 2019:14 and EN 15804.

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4.5 PROCESS FLOW DIAGRAM

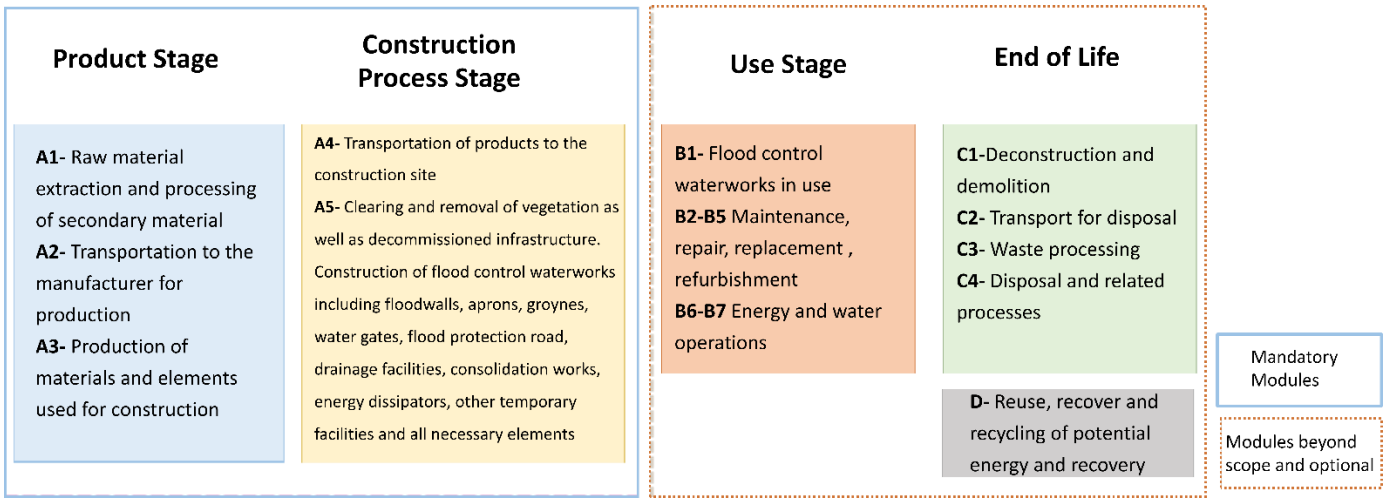

Figure 3. Process flow diagram illustrating the processes that shall be included in the product system, divided into the life-cycle stages. The illustration of processes to include may not be exhaustive.

4.6 ALLOCATION RULES

See PCR 2019:14 and EN 15804.

4.7 DATA CATEGORIES AND DATA QUALITY RULES

See PCR 2019:14 and EN 15804.

4.8 OTHER LCA RULES

See PCR 2019:14.

4.8.1 PRODUCT STAGE, A1-A3

See PCR 2019:14 and EN 15804.

4.8.2 CONSTRUCTION PROCESS STAGE, MODULES A4-A5

See PCR 2019:14 and EN 15804.

4.8.3 END-OF-LIFE STAGE, MODULES C1-C4

See PCR 2019:14 and EN 15804.

4.8.4 CONSEQUENCES FOR RECOVERED MATERIAL/ENERGY BEYOND THE PRODUCT LIFE CYCLE (MODULE D)

See PCR 2019:14 and EN 15804.

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4.9 ENVIRONMENTAL PERFORMANCE INDICATORS

See PCR 2019:14 and EN 15804.

4.10 SPECIFIC RULES PER EPD TYPE

See PCR 2019:14.

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5 CONTENT OF THE LCA REPORT

See PCR 2019:14.

5.1 LAYOUT OF THE PRESENTATION

See PCR 2019:14.

5.2 DESCRIPTION OF THE LCA MODELLING

See PCR 2019:14.

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6 CONTENT AND FORMAT OF EPD

See PCR 2019:14.

6.1 EPD LANGUAGES

See PCR 2019:14.

6.2 UNITS AND QUANTITIES

See PCR 2019:14.

6.3 USE OF IMAGES IN EPD

See PCR 2019:14.

6.4 SECTIONS OF THE EPD

See PCR 2019:14.

6.4.1 COVER PAGE

See PCR 2019:14.

6.4.2 GENERAL INFORMATION

See PCR 2019:14.

6.4.3 INFORMATION ABOUT EPD OWNER

See PCR 2019:14.

6.4.4 PRODUCT INFORMATION

See PCR 2019:14.

6.4.5 CONTENT DECLARATION

See PCR 2019:14.

6.4.6 LCA INFORMATION

See PCR 2019:14.

6.4.7 ENVIRONMENTAL PERFORMANCE

See PCR 2019:14.

6.4.8 ADDITIONAL ENVIRONMENTAL INFORMATION

See PCR 2019:14.

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6.4.9 ADDITIONAL SOCIAL AND ECONOMIC INFORMATION

See PCR 2019:14.

6.4.10 INFORMATION RELATED TO SECTOR EPDS

See PCR 2019:14.

6.4.11 VERSION HISTORY

6.4.12 ABBREVIATIONS

See PCR 2019:14.

6.4.13 REFERENCES

See PCR 2019:14.

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7 LIST OF ABBREVIATIONS

In addition to abbreviations listed in PCR 2019:14, Section 7:

8 REFERENCES

CEN (2021) EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

EPD International (2024) PCR 2019:14 Construction products, version 2.0.0.

EPD International (2021) General Programme Instructions of the International EPD System. Version 5.0.0, dated 2024-06-19. www.environdec.com.

ISO (2006a) ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

ISO (2006b) ISO 14040:2006, Environmental management – Life cycle assessment – Principles and framework.

ISO (2006c) ISO 14044: 2006, Environmental management – Life cycle assessment – Requirements and guidelines.

ISO (2017) ISO 21930:2017, Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services.

ISO 14025:2006 "Environmental labels and declarations"

Water Resources Engineering Technical Specifications - River Management Volume (Parts I & II), 102nd Year of the Republic of China, Ministry of Economic Affairs, Water Resources Agency.

ASCE 24-14: "Flood Resistant Design and Construction"

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9 VERSION HISTORY OF C-PCR

VERSION 1.0.0, 2026-05-07

Original version of this c-PCR

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