EPD
INTERNATIONAL EPD SYSTEM

REHABILITATION OF HIGHWAYS, STREETS AND ROADS

PRODUCT GROUP CLASSIFICATION: UN CPC 554211

C-PCR-012 (TO PCR 2019:14)
VERSION 1.0.0

TABLE OF CONTENTS

1 INTRODUCTION

1.1 GENERAL

This document constitutes complementary Product Category Rules (c-PCR) for developing Environmental Product Declarations (EPD) in the framework of the International EPD System: a programme for EPDs[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] developed in the framework of the International EPD System: a programme for type III environmental declarations[3] according to ISO 14025:2006. EPDs are voluntary documents for a company or an industry association to present transparent, consistent, and verifiable information about the environmental performance of their products (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. A PCR complements 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), thereby enabling the generation of consistent EPDs within a product category.

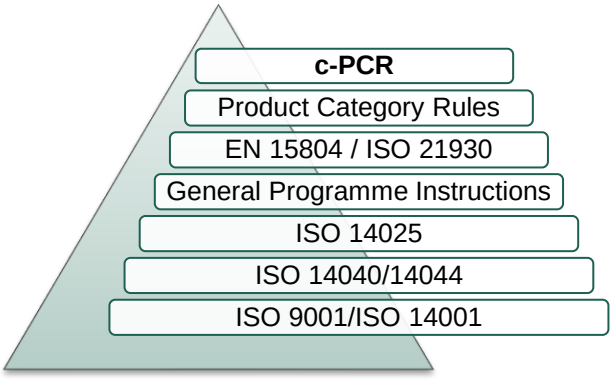

Figure 1 This c-PCR in relation to the hierarchy of standards and other documents.

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 other terms used in the document, see the GPI, normative standards, and PCR 2019:14 Construction products.

The latest version of the PCR is available on www.environdec.com.

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

Stakeholder feedback on PCRs is very much encouraged. Any comments on this PCR document may be sent directly to the PCR Moderator during its development or during the period of validity.

The programme operator maintains the copyright of the document to ensure that it is possible to publish, update when necessary, and 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 7 is intended unless otherwise stated.

3 Type III environmental declarations in the International EPD System are referred to as EPD, Environmental Product Declarations.

1.2 ROLE OF THIS DOCUMENT

This document provides complementary product category rules (c-PCR) to PCR 2019:14 Construction products, available on www.environdec.com. This document cannot be used by itself but shall be used together with PCR 2019:14 and EN 15804. The document can be used together with any valid version of PCR 2019:14, regardless of the version of PCR 2019:14 referred to in this document.

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

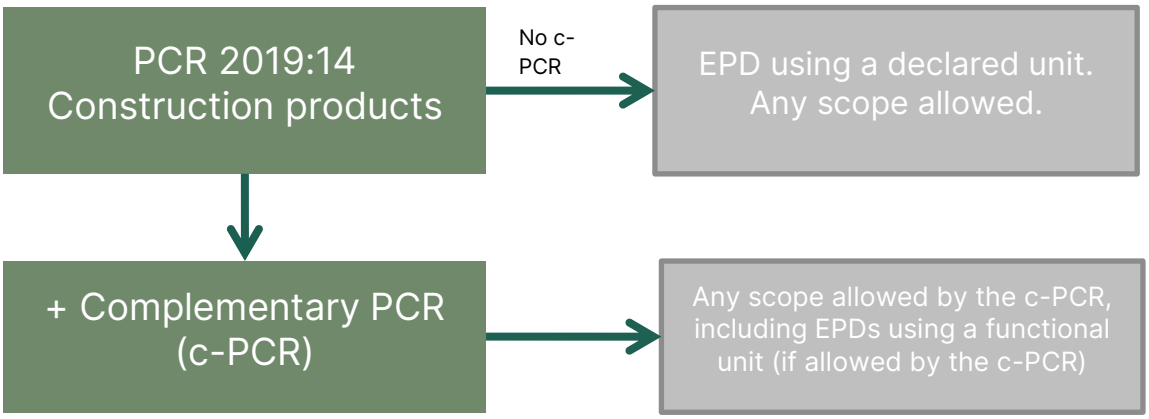

Figure 2 Overview of using PCR 2019:14 directly to develop an EPD or how to use it together with a c-PCR.

2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	Rehabilitation of highways, streets and roads
Registration number and version:	c-PCR-012, 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:	Rubén Jiménez de la Iglesia, Solid Forest S.L.
PCR Committee:	Solid Forest S.L., CIEMAT, REPSOL, SACYR, ACCIONA and CHL
Date of publication and last revision:	2025-04-11 (version 1.0.0) A version history is available in Section 8.
Valid until:	2026-07-09
Schedule for renewal:	This document will be revised upon its expiration. In case a c-PCR is developed by a CEN Product TC, the standard will replace this c-PCR.
Standards conformance:	For compliance to standards and other documents, see PCR 2019:14.
PCR language(s):	This PCR was developed and is available in English. 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

This document provides Complementary Product Category Rules (c-PCR) for the assessment of the environmental performance of Rehabilitation Projects of Highways, Streets and Roads corresponding to a subset of UN CPC 54211 (General construction services of highways [except elevated highways], streets and roads) and to UN CPC 5422 (construction services of elevated highways, tunnels and bridges) and the declaration of this performance by an EPD.

This UN CPC subclass includes:

- repair, alteration, and restoration services for:
  - formations for highways (except elevated highways), roads, streets, other vehicular and pedestrian ways and open car parks,
  - footpaths, traffic-calming structures, cycle tracks, etc.,
  - vehicular and pedestrian underpasses and overpasses,
- construction or restoration of road surface and parking lots with asphalt, concrete, etc.,
- installation services of crash barriers, low separating walls, traffic signs, etc.,
- creation, maintenance and signposting of tracks and paths, and
- painting services of markings on roads, parking lots and similar surfaces.

The construction of new elements, or the use of new techniques, including electronic products like HVAC products, that modify the Service Life (SL) of a highway, street or road are included in this c-PCR.

2.2.2 TYPE OF EPD AND INFORMATION MODULES INCLUDED

This c-PCR allows for the following types of EPDs:

a) Cradle to gate: (A1-A5).

b) Cradle to grave: (A1-A5 + B1-B2 + B6-B7).

c) Cradle to gate and module D: (A1-A5 + D).

d) Cradle to grave and module D: (A1-A5 + B1-B7 + D).

2.2.3 GEOGRAPHICAL REGION

As in PCR 2019:14.

2.2.4 EPD VALIDITY

As in PCR 2019:14.

3 PCR REVIEW AND BACKGROUND INFORMATION

This PCR was developed in accordance with the process defined in the General Programme Instructions of the International EPD® System, including open consultation and review of the final draft PCR.

3.1 PCR REVIEW

3.1.1 VERSION 2020-07-09

PCR review panel:	The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. The review panel may be contacted via info@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR moderator or PCR committee and if so were excused from the review.
Chair of the PCR review:	Claudia Peña
Review dates:	2021-04-22 until 2021-05-17

3.2 OPEN CONSULTATION

3.2.1 VERSION 2021-07-09

This PCR was available for open consultation from 2020-04-06 until 2020-06-06, during which any stakeholder was able to provide comments by posting on the PCR forum on www.environdec.com or by contacting the PCR moderator.

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. No stakeholders provided comments during the open consultation.

3.3 EXISTING PCRS FOR THE PRODUCT CATEGORY

This c-PCR is an upgrade of "PCR 2012:01-SUB-PCR-K Rehabilitation services of highways, streets and roads", which was based on EN 15804:A1, to allow the declaration of EPDs for the product category, under the main PCR 2019:14 Construction products, following EN 15804:A2, in the International EPD® System.

In the International EPD® System there are two other PCRs related to this c-PCR:

- "PCR 2013:20 Highways, streets and roads (except elevated highways)" defines the rules to develop EPD for construction projects of highways, roads, or streets according to EN 15804:A1.
- "PCR 2018:04 Asphalt mixtures" defines the rules to develop EPD for bitumen and asphalt manufacturing according to EN 15804:A2.

Section 4.3.1 of this document refers to PCR 2018:14.

3.4 REASONING FOR DEVELOPMENT OF c-PCR

This c-PCR was developed to provide complementary rules for publication of Environmental Product Declarations (EPD) for this product category based on ISO 14025, ISO 14040/14044, EN 15804:A2, and other relevant standards to be used in different applications and target audiences.

A complete and objective environmental assessment of a rehabilitation project of a road or highway has to follow and include some special guidelines that are described in this c-PCR such as: The mandatory inclusion in the EPD of the environmental

analysis of the future estimated road maintenance works after the rehabilitation[4]; the report of the environmental results considering the type of road or highways rehabilitated[5]; the mandatory reporting of some complementary environmental impacts[6].

3.5 UNDERLYING STUDIES

As in PCR 2019:14.

[4] See 4.2 Reference Service Life (RSL)

[5] See 4.1 Functional or declared unit

[6] See 5.5.3.6 Other Environmental Indicators

4 GOAL AND SCOPE, LIFE CYCLE INVENTORY AND LIFE CYCLE IMPACT ASSESSMENT

As in PCR 2019:14 with the following additions.

4.1 FUNCTIONAL UNIT

The environmental performance results and the inventory indicators shall be reported per one square of rehabilitated road divided by years of estimated service life[7] (ESL) of the road after the rehabilitation. For example, if a rehabilitation action has an ESL of X year, the environmental impacts from the rehabilitation service shall be divided by X. The environmental performance results from all the materials and works required for maintenance after the rehabilitation of the road shall be included based on their ESL value. The results shall be calculated based on the reference service life (RSL) of each material, for example, if a material has a RSL of X year, the results from that material shall be divided by X.

To support comparability, the environmental performance results should also be reported allocated to freight and passenger transports measured as Annual Average Daily Traffic (AADT), that is performed on the infrastructure for freight and passenger transports, respectively. The allocation to freight and passenger measured as Annual Average Daily Traffic (AADT) shall be performed on the infrastructure for freight and passenger transports, respectively. Freight transports then get the share AADT (freight)/AADT(total) and passenger transports get the share AADT(passenger)/AADT(total).

4.2 REFERENCE SERVICE LIFE (RSL)

The service life of the highway, road or street rehabilitation service is the period between rehabilitation projects. Rehabilitation projects are usually initiated when the performance of the highway does not meet initial requirements and maintenance is no longer possible.

The system boundary of the EPD shall include the maintenance works after the rehabilitation and before the next rehabilitation work.

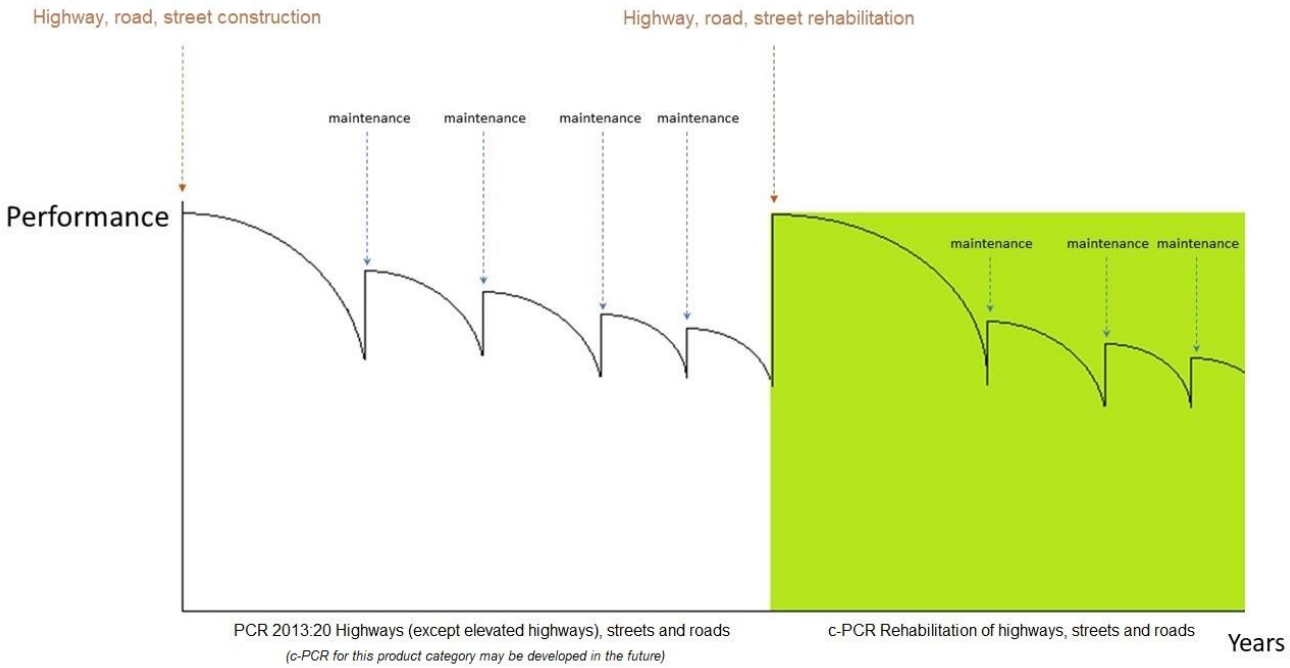

Figure 3 Activities included in the c-PCR are coloured in green.

The application of new techniques in the rehabilitation works to lengthen the periodicity or reduce the number of maintenances works of the highway shall be described in the EPD.

The construction of new elements or the use of new techniques that could modify the service life of the highway or the necessary maintenance works shall be described in the EPD.

4.3 SYSTEM BOUNDARIES

The scope of this c-PCR Rehabilitation of Highways, Roads and Streets is B4, Replacement process of a highway, road, or street, according to the below EN 15804 stages.

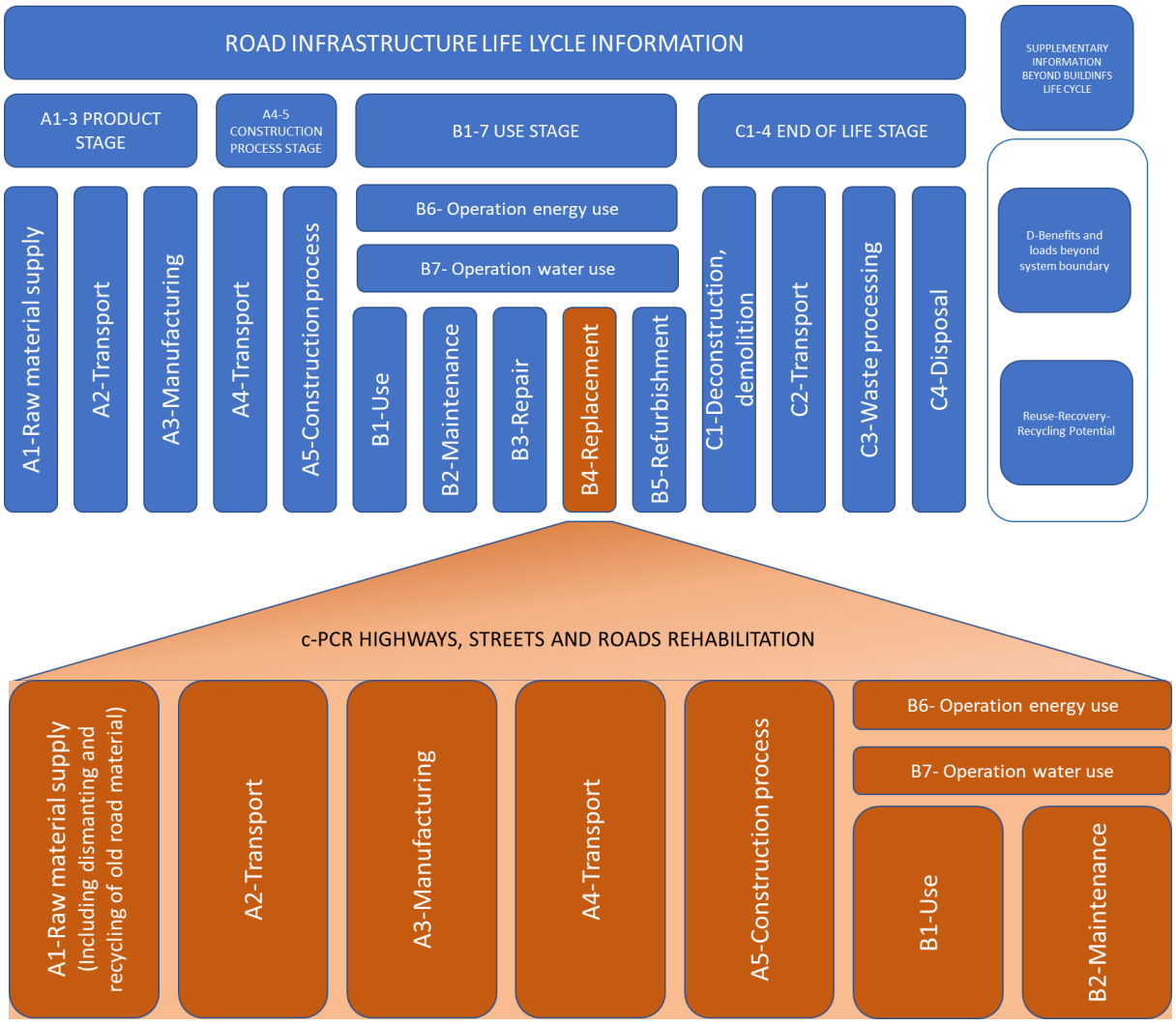

Figure 4 Life-cycle stages of this c-PCR on rehabilitation of highways, streets, and roads.

Other important considerations about process and elements that shall or shall not be included in the EPD are listed below.

If the rehabilitation project includes the rehabilitation of pavements on bridges, in tunnels or the rehabilitation of elevated highways these shall be included in the EPD.

The construction of new elements or the use of new techniques, including electronic products like HVAC products, that modify the Estimated Service Life (ESL) of a highway, street or road shall be included in the EPD.

The construction of new wildlife underpasses and the water underpasses during the rehabilitation project shall be included in the EPD.

The maintenance of auxiliary elements like signposting, road lighting, painting, crash barriers etc. shall not be included in the EPD.

The study and design stage of the rehabilitation works shall be included in the EPD.

4.3.1 RAW MATERIAL SUPPLY (A1)

Extraction of raw materials used in the manufacture of components with a not on-site recycled origin (not extracted and reused in the same rehabilitation project).

- Milling:
  - Collection of waste fraction from the deconstruction site.
  - On-site sorting of the materials.
- On-site or off-site recycling:
  - Waste processing of the materials intended for reuse (consider only materials used in the current rehabilitation project).
  - Materials manufactured from construction site waste fractions.
  - Compounds added to recycled materials.
  - Transportation of recycled materials.

The environmental performance of compounds used in the rehabilitation service must have been calculated following PCR 2018:04 Asphalt mixtures (following EN 15804: A1), or PCR 2019:14 and (if available) an applicable c-PCR (following EN 15804:A2), in the International EPD® System.

If specific data is used to calculate the environmental performance of material manufactured from construction site waste fractions or on-site recycled, the environmental impact must be calculated using the PCR 2018:04 Asphalt mixtures (following EN 15804: A1), or PCR 2019:14 and (if available) an applicable c-PCR (following EN 15804:A2), of the International EPD® System.

4.3.2 TRANSPORT OF RAW MATERIAL (A2)

- Transport to the factory where raw materials are processed.
- Internal transports.

4.3.3 MANUFACTURING (NEITHER ON-SITE RECYCLED MATERIALS NOR MATERIALS MANUFACTURED FROM CONSTRUCTION SITE WASTE FRACTIONS) (A3)

- Production of new road pavement materials (e.g., bitumen, cement, gravel production, etc.).
- Production of compounds added to recycled materials.
- Production of road substructure materials (e.g., production of piles, ballast, etc.).
- Production of auxiliary products (e.g., detergents for cleaning, etc.)
- Packaging.

4.3.4 TRANSPORT (A4)

- Transport to the rehabilitation site.
- Transport on the rehabilitation site.

4.3.5 CONSTRUCTION WORKS (A5)

- Preparatory works (construction of new temporally lanes, traffic modifications, etc.).
- Ground works.
- Construction of new road substructure, if necessary.
- Manufacturing of new road pavement with use of onsite or offsite recycled material.
- Application of new road pavements.
- Construction of disembarkation and parking spaces for maintenance vehicles.
- On-site energy generation.
- Waste treatment of waste generated during construction.

4.3.6 USE (B1, B6, B7)

Energy and water consumption during use stage, if existing.

4.3.7 MAINTENANCE (B2)

- Maintenance works required after rehabilitation.
- Modifications to the maintenance works of the highway after rehabilitation.

4.3.8 OTHER WORKS

Construction of elements that could extend the lifetime of the highway.

The report in the EPD of environmental benefits and loads beyond the system boundaries (BLBSB), in module D, resulting from reusable and recyclable materials and/or useful energy carriers leaving a product system e.g., as secondary materials or fuels, is recommended.

4.4 OTHER CALCULATION RULES AND SCENARIOS

As in PCR 2019:14.

5 CONTENT AND FORMAT OF EPD

As in PCR 2019:14 with the following additions.

5.1 SPECIFICATION OF THE SERVICE

General information defined in PCR 2019:14, section 9.1, shall be included. Additional mandatory and recommended information about the rehabilitation project is given in the table below.

Mandatory information	The location and design of the rehabilitation works shall be described. A simple visual representation.
	Unequivocal identification of the road according to the CPC classification system.
	Rehabilitation technique applied.
	Traffic Management System characteristics.
	Description of the traffic intensity of the road.
	Road type (e.g., freeway, highway).
	Junctions.
	Speed limits.
	Number of lanes before and after rehabilitation.
	Road width.
	Pavement type.
	Roadside equipment such as traffic barriers and road lightning.
	Regular need of operation and maintenance after rehabilitation.
Recommended information	Trade name (if found relevant).
	Short description of the underlying LCA-based information (e.g., summary of an existing LCA study or similar studies).
	Annual average daily traffic (AADT).
	Bearing capacity.
	Geology, geography, and climate may be described if relevant.

5.2 ENVIRONMENTAL PERFORMANCE INDICATORS

The environmental performance indicators defined in PCR 2019:14 shall be reported in the EPD. Additionally, the following mandatory indicators shall be reported in the EPD:

- Inorganic particles/substances with respiratory effects express as kg PM2,5 (Particulate Matter with a diameter of 2,5 µm or less.) equivalent. UNEP 2016 Method.
- Ecotoxicity: Expressed as CTUe (Comparative Toxic Units ecotoxicity). USEtox 2.1. (Rosenbaum et al, 2008) Method.
- Human Toxicity with cancer effects: Expressed as CTUh (Comparative Toxic Unit for humans). USEtox 2.1. (Rosenbaum et al, 2008) Method.
- Human Toxicity with non-cancer effects: Expressed also as CTUh (Comparative Toxic Unit for humans). USEtox 2.1. (Rosenbaum et al, 2008) Method.

Other environmental information may be calculated and reported in the EPD including: Impacts on biodiversity (permeability of transport corridors, safety and mortality, disturbance of surrounding habitats, natural flora and fauna and created natural values), noise and vibration (direct impact from rehabilitation works, impact on relevant areas, undertaken improvements of noise impact and vibrations), urban heat island effect and permanent deforestation.

Any indicators declared should be based on international standards or similar documents developed in a transparent procedure.

6 GLOSSARY

As in PCR 2019:14.

7 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 (2025) PCR 2019:14 Construction products, version 2.0.0. www.environdec.com

EPD International (2019a) PCR 2013:20 Highways (except elevated highways), streets and roads, version 2.11. www.environdec.com

EPD International (2019b) PCR 2018:04 Asphalt mixtures, version 1.03. 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.

8 VERSION HISTORY OF C-PCR

VERSION 2021-07-09

Original version, complementing PCR 2019:14 Construction products.

VERSION 2024-04-30

- Updated validity to align with PCR 2019:14 version 1.3.4
- Updates in references

VERSION 1.0.0, 2025-04-11

- Updated with prolonged validity, until five years from the original publication of the PCR.
- Changed from version date to version number.
- Other editorial changes and clarifications, e.g., related to the use of the c-PCR (see Section 1.2).
- Removed references to specific sections of PCR 2019:14, as the sections of PCR 2019:14 changed as of the publication of version 2.0.0 in 2025-04-07 and as this c-PCR is applicable together with any version of PCR 2019:14.