

HIGHWAYS (EXCEPT ELEVATED HIGHWAYS), STREETS AND ROADS
PRODUCT GROUP CLASSIFICATION: UN CPC 53211

C-PCR-XXX (TO PCR 2019:14)

DRAFT VERSION FOR OPEN CONSULTATION. DO NOT USE OR CITE.



**DRAFT PCR FOR OPEN
CONSULTATION**

INTRODUCTION TO OPEN CONSULTATION

This draft c-PCR document is available for open consultation until 2022-05-24. Feel free to forward the draft to any other stakeholder you might think is relevant, including colleagues and other organisations.

This is the first version of this document to be developed. We are therefore interested in comments from stakeholders on:

- General
 - o Alignment with PCRs available in other programmes for type III environmental declarations, industry-specific LCA guides or similar.
- Scope of PCR
 - o Product category definition and description
 - o Classification of product category using CPC codes
- Goal and scope, life cycle inventory and life cycle impact assessment
 - o Functional unit/declared unit
 - o System boundary
 - o Allocation rules
 - o Data quality requirements
 - o Recommended databases for generic data
 - o Impact categories and impact assessment methodology
- Additional information

Comments may be sent directly to the PCR Moderator (contact details available in Section 1). There is a template for comments on www.environdec.com that may be used.

For questions about the PCR, please contact the PCR Moderator. For general questions about the International EPD® System, EPD or PCR development, please contact the Secretariat via pcr@environdec.com.

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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 type III environmental declarations¹ according to ISO 14025:2006, ISO 14040:2006, ISO 14044:2006, and product-specific standards such as EN 15804 and ISO 21930 for construction products. Environmental Product Declarations (EPD) 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 rules for the overall administration and operation of the programme are the General Programme Instructions (GPI), publicly available at www.environdec.com. PCRs and c-PCRs complement the GPI and the normative standards by providing specific rules, requirements 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.

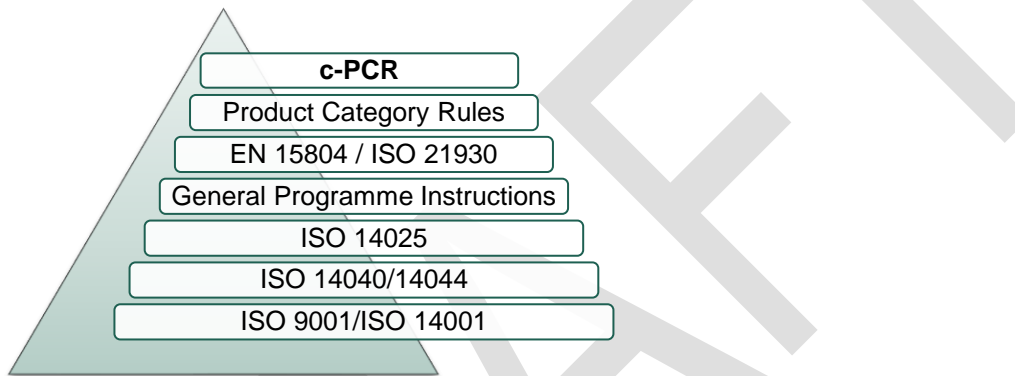


Figure 1 This c-PCR in relation to the hierarchy of standards and other documents.

Within the present c-PCR, the following terminology is adopted:

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

For definitions of further terms used in the document, see the normative standards.

A 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 at 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 document to ensure that it is possible to publish, update, and make it available to all organisations to develop and register EPDs. Stakeholders participating in c-PCR development should be acknowledged in the final document and on the website.

¹ 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 at www.environdec.com. This document cannot be used by itself but shall be used together with PCR 2019:14 and the European standard EN 15804:2012+A2:2019 (called EN 15804 in short). If a c-PCR is available for a product category, it shall be used.

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.

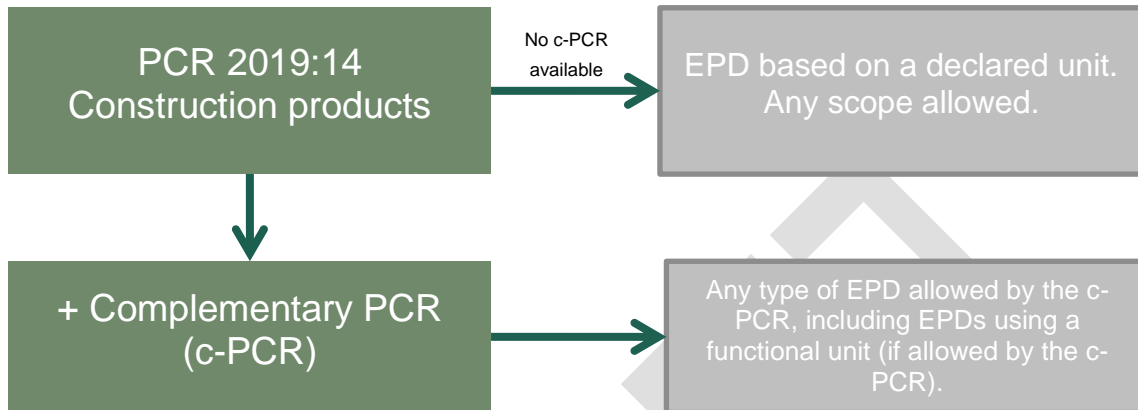


Figure 2 Overview of using PCR 2019:14 directly to develop an EPD, or how to use it together with a c-PCR.

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2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	c-PCR Highways (except elevated highways), streets, roads
Registration number and version:	<i>Added by the Secretariat</i>
Programme:	 The International EPD System
Programme operator:	EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden. Website: www.environdec.com E-mail: info@environdec.com
PCR Moderator:	Susanna Toller, The Swedish Transport Administration (Trafikverket), susanna.toller@trafikverket.se
PCR Committee:	The Swedish Transport Administration, WSP, SolidForest, Alstom, The Norwegian Public Roads Administration, Danish Road Directorate
Date of publication and last revision:	<i>Added by the Secretariat</i>
Valid until:	<i>Added by the Secretariat</i>
Schedule for renewal:	This document will be revised together with the PCR for Construction products. 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.
Standards conformance:	<ul style="list-style-type: none"> ▪ General Programme Instructions (GPI) of the International EPD System, version 4.0, based on ISO 14025:2006, ISO 14040:2006 and ISO 14044:2006 ▪ EN 15804:2012+A2:2019 ▪ ISO 21930:2017. This standard is used in selected sections, such as allocation, when it provides additional but not contradictory rules to EN 15804. <p>All EPDs based on this PCR shall be compliant with EN 15804:2012+A2:2019. If additional rules are followed, e.g. additional indicators, this PCR may also be used to develop an EPD compliant with ISO 21930:2017.</p>
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 c-PCR for the assessment of the environmental performance of Highways, streets and roads and the declaration of this performance by an EPD. The product category corresponds to UN CPC 53211.

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- 532 Civil engineering works
 - 5321 Highways (except elevated highways), streets, roads, railways and airfield runways
 - 53211 Highways (except elevated highways), streets, roads

This UN CPC subclass includes:

- highways (except elevated highways), streets, roads and other vehicular and pedestrian ways
- surfaced parking areas, driveways, pedestrian walkways and bicycle paths
- vehicular and pedestrian underpasses and overpasses
- safety installations for roads etc.

This UN CPC subclass does not include:

- elevated highways, cf. UN CPC 53221
- bridges, cf. UN CPC 53221
- highway tunnels, cf. UN CPC 53222

Additional information is available on <https://unstats.un.org/unsd/classifications/Family/Detail/1074>.

The term "roads" is used as short for *Highways, streets and roads (except elevated highways)* in following sections in this c-PCR.

2.2.2 TYPE OF EPD AND INFORMATION MODULES INCLUDED

This c-PCR can be used for developing EPD's for road infrastructure of many different reasons and stages. For example:

- In planning/design for new infrastructure
- For completed new infrastructure (as built)
- For rehabilitation of existing infrastructure (reinvestment)

The purpose and preconditions for the EPD shall be declared, see section 5.4.1.

Following the requirements in Section 2.2.2 of PCR 2019:14, an EPD based on this c-PCR may be of types:

- Cradle to grave and module D (A + B + C + D), or
- Cradle to gate with modules A4-A5, C1-C4 and module D (A + C + D).

2.2.3 GEOGRAPHICAL SCOPE

This c-PCR may be used globally.

2.2.4 EPD VALIDITY

See PCR 2019:14.

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 20XX-YY-ZZ

This c-PCR was available for open consultation from 2022-03-25 until 2022-05-24, during which any stakeholder was able to provide comments by contacting the PCR Moderator and/or the Secretariat.

A web-based meeting will be held during the open consultation, 12th of May 2022. A selected open consultation group was invited via e-mail, however it was also announced by the Secretariat and any interested stakeholders are welcome to participate. The meeting will inform the stakeholders about the development process and make it possible for participants to present their point of views at the draft. Contact the PCR Moderator (susanna.toller@trafikverket.se) if you want to participate.

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. The following stakeholders provided comments during the open consultation and agreed to be listed as contributors in the c-PCR and at www.environdec.com.

- *List of stakeholder names and affiliation to be added after the open consultation*

3.2 PCR REVIEW

3.2.1 VERSION 20XX-YY-ZZ

PCR review panel:	The Technical Committee of the International EPD® System. A full list of members is available at 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 Committee, and if there were conflicts of interest they were excused from the review.
Chair of the PCR review:	<i>Added by the Secretariat</i>
Review dates:	<i>Added by the Secretariat</i>

3.3 EXISTING PCRS FOR THE PRODUCT CATEGORY

As part of the development of this c-PCR, existing PCRs/c-PCRs and other internationally standardised methods that could potentially act as c-PCRs 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.
- The Norwegian EPD Foundation, www.epd-norge.no
- EPD Italy, www.epditaly.it
- The Institut Bauen und Umwelt e.V, ibu-epd.com

Table 1 lists the identified PCRs and other standardised methods.

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

NAME OF PCR/c-PCR/STANDARD	PROGRAMME/ STANDARDISATION BODY	REGISTRATION NUMBER, VERSION NUMBER/DATE OF PUBLICATION	SCOPE
PCR 2013:19 Railways	International EPD® System	PCR 2013:19, Version 2.11	UN CPC 532 Civil engineering works UN CPC 5321 Highways (except elevated highways), streets, roads, railways and airfield runways UN CPC 53212 Railways
PCR 2009:03 Rail transport	International EPD® System	Expired	UN CPC 53212 Railways
PCR 2013:20 Highways (except elevated highways), streets and roads	International EPD® System	PCR 2013:20, Version 2.1	UN CPC 53211 Highways (except elevated highways), streets and road
EPDItaly022, Use of Highways, streets, roads and airfield.	EPDItaly	EPDItaly022, Version 1, Issue date 2021-01-29	UN CPC 53211 Highways (except elevated highways), streets and road
C-PCR-012 (TO PCR 2019:14) Rehabilitation of Highways, streets and roads.	International EPD® System	C-PCR-012 (TO PCR 2019:14), Version: 2021-07-09	UN CPC 54211 (General construction services of highways [except elevated highways], streets and roads)
PCR 2014:02, Building	International EPD® System	PCR 2014:02, Version 2.01	UN CPC 531
EN 15978:2011 Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method	CEN, European committee for standardization	STD-82222, Version 1, 2011-11-21	
EN 17472 Sustainability of construction works - Sustainability assessment civil engineering works - Calculation methods	CEN, European committee for standardization	Not Published	ICS 91.040.01 - Buildings in general

3.4 REASONING FOR DEVELOPMENT OF C-PCR

This c-PCR was developed to provide requirements and guidelines 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 products of the same product category, and thereby it supports comparability of products within a product category.

This c-PCR will over time replace PCR 2013:20 Highways, streets and roads (except elevated highways), which was based on EN 15804:A1. This c-PCR harmonizes with the c-PCR Template for PCR 2019-14 Construction products, following EN 15804:A2, in the International EPD® System.

3.5 UNDERLYING STUDIES USED FOR C-PCR DEVELOPMENT

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:

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- PCRs/c-PCRs and other internationally standardized methods presented in the table in section 3.3.
- EPDs of railways and roads have been studied to evaluate the c-PCR application.
- Guide for LCA of Road and Rail Infrastructure, Report number 2020-09, NordLCA

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

This section provides specific rules, requirements and guidelines for developing an EPD for the product category as defined in [Section 2.2.1](#).

4.1 DECLARED UNIT

The declared unit for road infrastructure is defined as the whole road project, including environmental performance results and inventory indicators for all life cycle stages studied, depending on type of EPD. If life cycle module B is included in the EPD, the declared unit is defined as the whole road project over the defined Reference Study Period (RSP).

It is recommended to include project specific information (see 5.4) in the EPD to make it possible to convert results for the declared unit into other indicators, such as:

- per km of road or per km of lane
- per m² of road
- per Annual Average Daily Traffic (AADT) for passenger transports
- per Annual Average Daily Traffic (AADT) for freight transports

4.2 REFERENCE STUDY PERIOD (RSP) AND REFERENCE SERVICE LIFE (RSL)

Reference study period (RSP) is the period over which the time-dependent characteristics of the object of assessment are analysed (NS-EN 15978: 2011). A RSP has to be defined and declared if life cycle module B is included in the assessment. All activities, such as maintenance, repair, replacement and refurbishment as well as operational energy and water use, that may contribute to the environmental impacts over the RSP shall be included in the assessment.

Reference service life (RSL) is the service life of a construction product (that is a part of the road infrastructure) which is known to be expected under a particular set, i.e., a reference set, of in-use condition and which may form the basis of estimating the service life under other in-use conditions. A declared RSL shall be related to the declared functional and technical performance and to any maintenance or repair necessary to sustain the declared performance during the declared RSL. Assumptions for RSL shall be declared and used for assessment of maintenance and reinvestment of construction products during RSP if life cycle module B is included.

4.3 SYSTEM BOUNDARIES

EPDs that are developed based on this c-PCR shall cover product stage (A1-A3), construction process stage (A4-A5), end-of-life stage (C1-C4) as well as benefits and loads beyond the system boundary (D). Use stage (B1-B7) is optional but recommended. The scope allowed by this c-PCR, and requirements for excluding information modules, must be aligned with PCR 2019:14 and EN 15804.

If approved PCRs exist for parts of the road transport infrastructure, e.g. bridges and tunnels, the system boundaries specified in PCR for the subsystem shall be used. In case of conflicts between PCR for the subsystem and this c-PCR, system boundaries specified in PCR for the subsystem shall be used.

The following subsections describe the covered information modules and the respective processes. For detailed information on each module, see EN 15804 (Section 6.3.5). Here only specific descriptions related to this c-PCR are provided.

4.3.1 PRODUCT STAGE: MODULES A1-A3

See PCR 2019:14 and Section 6.3.5.2 of EN 15804. Examples of processes to include in A3 manufacturing of products and co-products:

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- Production of road pavement materials, e.g. bitumen, cement, gravel production
- Production of road substructure materials, e.g. production of piles, ballast etc.
- Production of road equipment materials; e.g. parapets, noise barriers, wildlife fences, traffic signals, bus stops, rest stops, lightning points, drainage etc.
- Production of road informatics devices materials, e.g. automatic road safety control systems, traffic-counting devices, weighing appliances etc.
- Production of materials needed for tunnel construction
- Production of materials needed for bridge construction

4.3.2 CONSTRUCTION PROCESS STAGE: MODULES A4-A5

See PCR 2019:14 and Section 6.3.5.3 of EN 15804. Examples of processes to include in A5 construction:

- Ground works
- Construction process for main parts and components
 - Construction of road pavement
 - Construction of road substructure
 - Construction of road equipment
 - Construction of road informatics devices
 - Construction of tunnels
 - Construction of bridges
 - Construction of disembarkation zones on the side of the road and parking spaces for maintenance vehicles
- Assembly of the final product
- Maintenance (e.g. of the machines) needed during construction
- Waste treatment of waste generated during construction;
- Production of electricity and used fuels

4.3.3 USE STAGE: MODULES B1-B7

See PCR 2019:14 and Section 6.3.5.4 of EN 15804. Examples of processes to include:

- B1, Use - Any emissions to the environment during anticipated use of road construction products, such as release of substances from the different materials of the road construction to air, soil or water.
- B2, Maintenance – Snow plowing, salting, drainage of trenches/ditches, planning and gluing of road surfaces etc.
- B3, Repair – Transport of work force, transport and replacement of spare parts etc.
- B4, Replacement - Includes all activities involved in planned replacement, according to RSL scenario, of a road infrastructure part or object by the same or similar type of part or object, including transport of products. For example replacement of pavement.
- B5, Refurbishment – Excavation work, geotechnical reinforcement etc. to upgrade technical performance.
- B6, Operational energy use – roadside lighting, pumping and tunnel ventilation etc.
- B7, Operational water use – Cleaning of bridges and other infrastructure parts, pumping of storm water and ground water etc.

Environmental impact from passenger and freight transport shall not be included.

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4.3.4 END-OF-LIFE (EOL) STAGE: MODULES C1-C4

See PCR 2019:14 and Section 6.3.5.5 of EN 15804. The choice of the road infrastructure's end-of-life scenario should be described in the EPD.

4.3.5 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY: MODULE D

See PCR 2019:14 and Section 6.4.3.3 of EN 15804. The choice of scenario for benefits and loads beyond the system boundary should be described in the EPD.

4.3.6 OTHER BOUNDARY SETTING

See PCR 2019:14 and EN 15804.

4.4 SYSTEM DIAGRAM

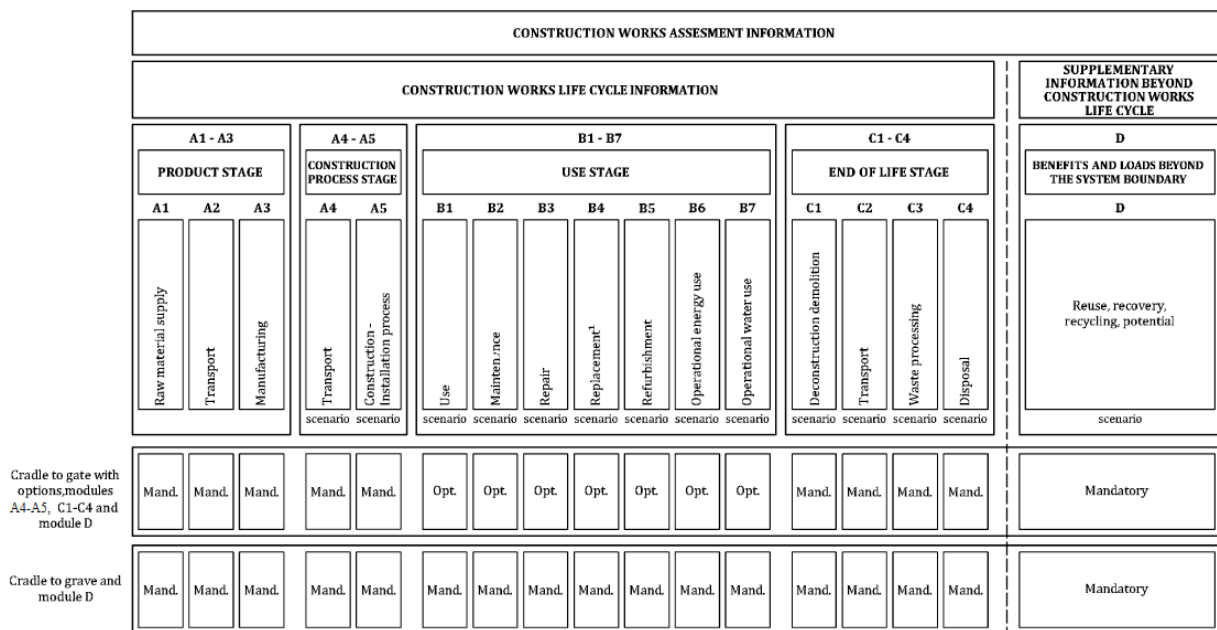


Figure 3 System diagram illustrating the processes that are included in the product system, divided into life-cycle stages and information modules. Illustration from EN15804, adapted to the allowed type of EPDs in this c-PCR.

4.5 CUT-OFF RULES

See PCR 2019:14 and EN 15804.

4.6 ALLOCATION RULES

See PCR 2019:14 and EN 15804.

4.7 DATA QUALITY REQUIREMENTS

See PCR 2019:14 and EN 15804.

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4.8 ENVIRONMENTAL PERFORMANCE INDICATORS

See PCR 2019:14 and EN 15804.

4.9 INCLUDING MULTIPLE PRODUCTS IN THE SAME EPD

See PCR 2019:14.

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5 CONTENT AND FORMAT OF EPD

See PCR 2019:14.

5.1 EPD LANGUAGE

See PCR 2019:14.

5.2 UNIT AND QUANTITIES

See PCR 2019:14.

5.3 USE OF IMAGES IN EPD

See PCR 2019:14.

5.4 EPD REPORTING FORMAT

See PCR 2019:14.

5.4.1 SPECIFICATION OF MANUFACTURING COMPANY AND PRODUCT

Required mandatory and recommended information about the manufacturing company is given in the table below.

Mandatory information	The infrastructure manager and owner (can be the same). An environmental management system may be cited.
	Short description of the organisation, including information on products- or management system-related certifications (e.g. ISO Type I ecolabels, ISO 9001- and 14001-certificates, EMAS-registrations etc.) and other relevant work the organisation wants to communicate (e.g. SA 18000, supply-chain management, social responsibility - SR etc.)
Recommended information	If the infrastructure comprises parts with different infrastructure managers and/or different technical characteristics, all the parts and infrastructure managers should be described.

Required mandatory and recommended information about the product is given in the table below.

Mandatory information	The location, boundaries and design of the infrastructure system (share of open section, share of tunnel section, and share of bridge section) shall be described. A simple visual representation or image of the product shall be given. The information may be based on a network statement.
	The extent of the project shall be described. If several activities is included, such as building a new 2+1 road and broadening of an existing road, it shall be described.
	Unequivocal identification of the product according to the CPC classification system
	Description of the intended use
	Road type (e.g. freeway, highway)

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	Annual average daily traffic (AADT) for both passenger and freight vehicles
	Km of road
	m ² of road
	Dimensions of the road
	Number of lanes
	Speed Limit
	All assumptions regarding RSP and RSL
Additional information may be given if relevant. For example:	Traffic Management System characteristics
	Junctions
	Pavement type
	Minimum radius of curvature
	Maximum gradient
	Maximum axle loading
	Bearing capacity
	Road side equipment such as traffic barriers and road lightning
	Regular need of operation and maintenance
	Geology, geography and climate may be described if relevant.

5.4.2 ADDITIONAL INFORMATION

For approved PCRs for other parts of the road transport infrastructure, e.g. bridges and tunnels, the specified impact indicators in PCR for the subsystem shall be used. In case of conflicts between PCR for the subsystem and this PCR, the impact indicators specified in PCR for the subsystem shall be used.

The following impacts shall be described and addressed in the EPD:

Impacts on biodiversity

Impact on the following core principles for biodiversity in infrastructure shall be described:

- Permeability of transport corridors
- Safety and mortality
- Disturbance of Surrounding habitats
- Conservation of habitats
- Natural flora and fauna
- Created natural values

Noise and vibrations:

The following parameters shall be addressed:

- Direct impact from infrastructure construction, maintenance and operation as well as from traffic, according to national set of regulations such as guide-line/limit/threshold values and using national methods of measurement or modelling.
- Impacts on relevant areas such as residential areas, sensitive biotopes or recreational areas, if relevant with comparison to a business as usual scenario.

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- Undertaken measurements for improvement of impacts from traffic noise and vibrations.
- Other impacts not shown by chosen indicators.

Water management

The following shall be addressed:

- Environmental impacts on water flows, groundwater levels, and water quality, both temporary under construction and permanent during operation of the infrastructure, shall be described.
- Measures taken to ensure that an acceptable ecological status is maintained in water flows, groundwater levels, and water quality during construction and operation phase of the infrastructure should be described.
- A description how non-harmful groundwater levels could be maintained during operation of the infrastructure.
- A description of the systems and routines used to ensure that environmental impacts on water flows, groundwater levels, and water quality, both temporary during construction and during operation of the infrastructure, are kept at acceptable levels.

If measures can be taken to minimize risk for causing ecological imbalance in water flows, groundwater levels, and/or water quality during construction of the infrastructure, it should be accounted for in the transport infrastructure PCR.

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6 LIST OF ABBREVIATIONS

See abbreviations listed in PCR 2019:14, Section 6.

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7 REFERENCES

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

EPD International (2019) PCR 2019:14 Construction products, version 1.2.

EPD International (2021) General Programme Instructions of the International EPD® System. Version 4.0, dated 2021-03-29.
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.

NordLCA (2020), Guide for LCA of Road and Rail Infrastructure, Report number 2020-09.

References in table 1 will be added.

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8 VERSION HISTORY OF C-PCR

VERSION 20XX-YY-ZZ

Original version of the c-PCR.

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