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Bæredygtighed inden for byggeri og anlæg – Vurdering af bæredygtighed af bygninger og anlægsarbejder – Del 5: Rammer for vurdering af bæredygtighed af anlægsarbejder

Sustainability of construction works – Sustainability assessment of buildings and civil engineering works – Part 5: Framework on specific principles and requirement for civil engineering works

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EUROPÄISCHE NORM

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English Version

Sustainability of construction works - Sustainability assessment of buildings and civil engineering works - Part 5: Framework on specific principles and requirement for civil engineering works

Contribution des ouvrages de construction au développement durable - Évaluation de la contribution des bâtiments et des ouvrages de génie civil au développement durable - Partie 5 : Cadre méthodologique définissant les principes et les exigences spécifiques aux ouvrages de génie civil

Nachhaltigkeit von Bauwerken - Bewertung der Nachhaltigkeit von Gebäuden und Ingenieurbauwerken - Teil 5: Leitfaden zu den Grundsätzen für und den Anforderungen an Ingenieurbauwerke

This European Standard was approved by CEN on 16 July 2017.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European foreword

This document ([EN 15643-5:2017](#)) has been prepared by Technical Committee CEN/TC 350 "Sustainability of construction works", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2018, and conflicting national standards shall be withdrawn at the latest by May 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document is part of a series of standards that consists of the following parts:

- [EN 15643-1](#), *Sustainability of construction works - Sustainability assessment of buildings - Part 1: General framework*
- [EN 15643-2](#), *Sustainability of construction works - Assessment of buildings - Part 2: Framework for the assessment of environmental performance*
- [EN 15643-3](#), *Sustainability of construction works - Assessment of buildings - Part 3: Framework for the assessment of social performance*
- [EN 15643-4](#), *Sustainability of construction works - Assessment of buildings - Part 4: Framework for the assessment of economic performance*
- [EN 15643-5](#), *Sustainability of construction works - Sustainability assessment of buildings and civil engineering works - Part 5: Framework on specific principles and requirement for civil engineering works*

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

This European Standard forms part of a series of European Standards, written by CEN/TC 350, that provide a system for the sustainability assessment of civil engineering works using a life cycle approach. The sustainability assessment quantifies aspects and impacts to assess the environmental, social and economic performance of civil engineering works using quantifiable indicators measured without value judgements. The purpose of this series of standards is to enable comparability of the results of assessments. This series of European Standards does not set benchmarks or levels of performance.

This series of standards will allow the sustainability assessment, i.e. the assessment of environmental, social and economic performance of a civil engineering works, to be made concurrently and on an equal footing, on the basis of the technical characteristics and functionality of the object of assessment.

The sustainability assessment of civil engineering works uses different types of information. The results of a sustainability assessment of a civil engineering works provide information on the different types of indicators, the related civil engineering works scenarios, and the life cycle stages included in the assessment.

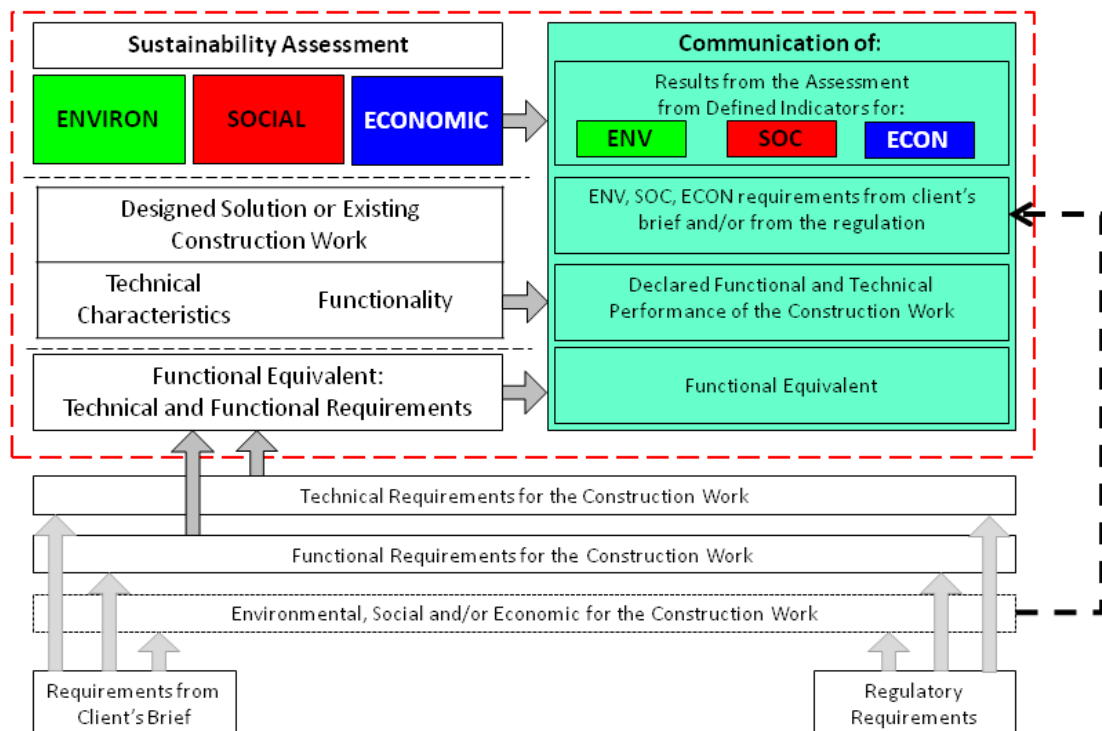
In carrying out assessments, scenarios and a functional equivalence are determined at the civil engineering works level. Assessment at the civil engineering works level means that the descriptive model of the works with the major technical and functional requirements has been defined in the client's brief or in the regulations, as illustrated in [Figure 1](#).

Assessments can be undertaken either for the whole civil engineering works, for a part of the civil engineering works or for a combination of several civil engineering works.

Although the evaluation of technical and functional performance is beyond the scope of this series of standards, the technical and functional characteristics are considered within this framework by reference to the functional equivalence. The functional equivalence takes into account the technical and functional requirements and forms the basis for comparisons of the results of the assessment.

Any particular demands for, or related to, the environmental, social and economic performance defined in the client's brief, or in regulations, may be declared and communicated. [Figure 1](#) shows how the functional equivalence, and the technical and functional characteristics that differ from those required, either by the client's brief or through regulations, are to be declared and communicated with the results of the assessment.

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NOTE — The outer box with the dotted line represents the area standardized by CEN/TC 350.

Figure 1 — Concept of sustainability assessment of Civil engineering works

In concept, the integrated civil engineering works performance incorporates environmental, social and economic performance as well as the technical and functional performance, and these are intrinsically related to each other, as illustrated in [Figure 2](#). Although the assessment of technical and functional performance does not form part of this series of standards, their interrelationship with environmental, social and economic performance is a prerequisite for an assessment of sustainability performance of civil engineering works and, therefore, is taken into account.

The users utilization impacts and aspect are part of the assessment, including those related to the possible ways of use of the infrastructure, the users utilization, and the way of capitalizing from the investment (e.g. the fuel consumed by the cars users of a road).

It is advisable to carry out an assessment at the earliest opportunity during the conceptual stages of a construction or refurbishment project such as in the initial planning stage in order to provide a broad estimate of the environmental performance, social performance and economic performance. As the project evolves, the assessment may be periodically reviewed and updated to support decision-making. A final assessment (as-built) should be carried out. The results of this final assessment can be used to inform all parties concerned, and also serve as the database for future new similar projects.

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Framework level	EN 15643-1 Sustainability of buildings – Part 1: general framework (TG)			Technical Characteristics	Functionality
	EN 15643-2 Assessment of buildings – Part 2: framework for the assessment of environmental performance (WG1)	EN 15643-3 Assessment of buildings – Part 3: framework for the assessment of social performance (WG5)	EN 15643-4 Assessment of buildings – Part 4: framework for the assessment of economic performance (WG4)		
	PrEN 15643-5 Assessment of building and Civil Engineering Works – Part 5: Framework on specific principles and requirement for civil engineering works (WG6)				
Works level	EN 15978 Assessment of environmental performance of buildings – Calculation method (WG1)	EN 16309 Assessment of social performance of buildings – Calculation methodology (WG5)	EN 16627 Assessment of economic performance of buildings – Calculation Method (WG4)		
	WI00350028 ASustainability of construction works – Sustainability assessment civil engineering works – Calculation methods (WG6)				
Product level	EN 15804 Environmental Product Declarations – Core rules for product category of construction products (WG3)	(See Note Below)	(See Note Below)		
	EN 15942 Environmental Product Declarations – Communication format – Business (WG3)	Note At present, technical information related to some aspects of social and economic performance are included under the provision of EN 15804 to form part of the EPD.			
	CEN/TR 15941 Environmental Product Declarations – Methodology for selection and use of generic data (WG3)				

NOTE — The coloured boxes represent the current work programme of CEN/TC 350.

Figure 2 — Work program of CEN/TC 350

This framework is a part of the framework standards for sustainability assessment of civil engineering works. The purpose of this [EN 15643-5](#) is to provide a framework with principles, requirements and guidelines for the assessment of the environmental, social and economic performance of a civil engineering works at the “framework level”. In the drafting of this European Standard, [ISO 21930](#) and [ISO/TS 21929-2](#) have been taken into consideration.

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1 Scope

This European Standard provides specific principles and requirements for the assessment of environmental, social and economic performance of civil engineering works taking into account its technical characteristics and functionality. Assessments of environmental, social and economic performance are the three aspects of sustainability assessment of civil engineering works.

The framework applies to all types of civil engineering works, both new and existing, and it is relevant for the assessment of the environmental, social and economic performance of new civil engineering works over their entire life cycle, and of existing civil engineering works over their remaining service life and end of life stage.

The sustainability performance assessment of civil engineering works concentrates on the assessment of aspects and impacts of civil engineering works expressed with quantifiable indicators. It includes the assessment of a civil engineering works' influence on the environmental, social and economic impacts and aspects of the local infrastructure beyond the area of the civil engineering works, and environmental impacts and aspects resulting from transportation of the users of the civil engineering works and the use and exploitation of the infrastructure itself. It excludes environmental, social and economic risk assessment, but the results of the risk assessment should be taken into consideration.

The European Standards developed under this framework do not set the rules for how the different assessment methodologies may provide valuation methods; nor do they prescribe levels, classes or benchmarks for measuring performance.

NOTE — Valuation methods, levels, classes or benchmarks can be prescribed in the requirements for environmental, social and economic performance in the client's brief, construction regulations, national standards, national codes of practice, civil engineering works assessment and certification schemes, etc.

The rules for assessment of environmental, social and economic aspects of organizations, such as management systems, are not included within this framework. However, the consequences of decisions or actions that influence the environmental, social and economic performance of the object of assessment are taken into account.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[EN 15804](#), *Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products*

[EN 15978](#), *Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method*

[EN 16309](#), *Sustainability of construction works - Assessment of social performance of buildings - Calculation methodology*

[EN 16627](#), *Sustainability of construction works - Assessment of economic performance of buildings - Calculation methods*

[EN ISO 14044](#), *Environmental management - Life cycle assessment - Requirements and guidelines (ISO 14044)*

[ISO 15392:2008](#), *Sustainability in building construction — General principles*

[ISO 15686-1:2011](#), *Buildings and constructed assets — Service life planning — Part 1: General principles and framework*

[ISO 15686-2](#), *Buildings and constructed assets — Service life planning — Part 2: Service life prediction procedures*

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[ISO 15686-7](#), *Buildings and constructed assets — Service life planning — Part 7: Performance evaluation for feedback of service life data from practice*

[ISO 15686-8](#), *Buildings and constructed assets — Service-life planning — Part 8: Reference service life and service-life estimation*

[ISO/TS 15686-9](#), *Buildings and constructed assets — Service-life planning — Part 9: Guidance on assessment of service-life data*

ISO/TS 21929-2, *Sustainability in building construction — Sustainability indicators — Part 2: Framework for the development of indicators for civil engineering works*