BS ISO 21931-2:2019

BSI Standards Publication

Sustainability in buildings and civil engineering works — Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment

Part 2: Civil engineering works

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National foreword

This British Standard is the UK implementation of ISO 21931-2:2019.

Attention is drawn to the fact that during the development of this international standard, the UK committee voted against its approval.

The UK participation in its preparation was entrusted to Technical Committee B/558, Sustainability of construction works.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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INTERNATIONAL STANDARD

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Sustainability in buildings and civil engineering works — Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment —

Part 2: Civil engineering works

Développement durable dans la construction — Cadre méthodologique de l'évaluation au sens du développement durable des performances environnementales, sociales et économiques des ouvrages de construction —

Partie 2: Ouvrages de génie civil

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works,* Subcommittee SC 17, *Sustainability in buildings and civil engineering works.*

A list of all parts in the ISO 21931 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

It is important to measure and understand the sustainability performance of civil engineering works in order to assess, communicate and improve their potential impacts on sustainable development.

This document establishes a framework for methods of assessment of the sustainability performance of civil engineering works and related external works, which is a central part of the process. The sustainability performance assessment evaluates aspects and impacts to assess the environmental, social and economic performance of civil engineering works using qualitative and quantitative indicators measured without value judgements. One of the primary purposes of this document is to improve the quality of the methods of assessment, which can enable greater comparability of the results of assessments. Such assessments can be used for benchmarking performance and monitoring progress towards improvement of performance.

Although there are not as many assessment methods for civil engineering works as there are for buildings, some can be found. The existence of these methods indicates a trend towards construction that contributes to sustainable development, whose main objectives are to minimize negative impacts and maximize positive direct and indirect impacts on sustainability, especially through a focus on

— use of resources (materials, water and energy) and waste generation,

— discharges into water, atmosphere and soil,

— biodiversity and ecosystems,

— social impacts, throughout the value chain, and

— innovative and proactive approach towards selecting the most beneficial and economical alternatives.

Methods of assessment of the sustainability performance of civil engineering works provide a basis for demonstrating and communicating the result of efforts to improve sustainability performance in construction works. The methods typically establish a means of assessing a broad range of considerations related to sustainability against explicitly declared criteria, and give a summary of sustainability performance.

Methods of assessment of the sustainability performance of civil engineering works provide:

— a common and verifiable set of references, so that civil engineering works owners, striving for increasing their beneficial contribution to sustainable development, have a means of measuring, evaluating and demonstrating that effort;

— a reference, for use as a common basis, by which the civil engineering works owners/managers, design teams, contractors and suppliers can formulate effective strategies regarding the design, construction and operation of civil engineering works, with the intent to improve sustainability performance;

— detailed information on the civil engineering works gathered and organized in such a way that it can be used to lower operating, financing and insurance costs and increase operating efficiency and life;

— a clear description of the factors considered to be the key sustainable considerations and their relative importance, thereby assisting the design process.

To achieve the practical goals noted above, methods of assessment of the sustainability performance of civil engineering works refer to limited criteria and seek a balance between rigor and practicality. The sustainability performance assessment of civil engineering works uses different types of information. The results of a sustainability performance 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. Life-cycle based approaches play an increasingly significant role for setting performance criteria within methods of assessment of sustainability performance of civil engineering works. In carrying out assessments, scenarios and a functional equivalent are determined

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at the civil engineering works level. Assessment at the civil engineering works level means that the descriptive model of the works, along with the major technical and functional requirements, has been defined in the client's brief or in the regulations.

However, the collection and maintenance of current data sets for the multitude of civil engineering works systems and elements may not be practically achievable at the moment. Also, the context of overall civil engineering works performance is important for considering each sustainable criterion.

Considering all these issues, the purpose of this document is to describe the framework and the principles that apply in the sustainability performance assessment of new and existing civil engineering works and their related site works, taking into account the various effects these civil engineering works are likely to have.

Practical relevant rules and recommendations concerning methods for the assessment of the sustainability performance of civil engineering works, which can exist on either a national or regional basis, can be examined and improved by the use of a framework for methods of assessment, which is the basis of this document.

An improvement of the sustainability performance of a civil engineering works requires an appropriate operation of the civil engineering works over its lifetime. In existing civil engineering works, it can be enhanced through the use of "sustainability-related" policies and the implementation of management systems.

This document is one in a suite of documents dealing with sustainability in construction works that includes the following:

a) ISO 15392, *Sustainability in buildings and civil engineering works — General principles*;

b) ISO 16745-1, *Sustainability in buildings and civil engineering works — Carbon metric of an existing building during use stage — Part 1: Calculation, reporting and communication*;

c) ISO 16745-2, *Sustainability in buildings and civil engineering works — Carbon metric of an existing building during use stage — Part 2: Verification*;

d) ISO 20887, *Sustainability in buildings and civil engineering works — Design for disassembly and adaptability of buildings*;

e) ISO 21929-1, *Sustainability in building construction — Sustainability indicators — Part 1: Framework for the development of indicators and a core set of indicators for buildings*;

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

g) ISO 21930, *Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services*;

h) ISO 21931-1, *Sustainability in buildings and civil engineering works — Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment — Part 1: Buildings*;

i) ISO 21931-2, *Sustainability in buildings and civil engineering works — Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment — Part 2: Civil engineering works*;

j) ISO/TS 12720, *Sustainability in buildings and civil engineering works — Guidelines on the application of the general principles in ISO 15392*;

k) ISO/TR 21932, *Sustainability in buildings and civil engineering works — A review of terminology*.

The relationship among the documents is elaborated in Figure 1.

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It should be noted that due to the wide range of different types and scale of civil engineering works it is not practical to include a single core set of indicators within this document. As a result there is a suite of inter-related standards that define the process of assessing the sustainability performance of civil engineering works that includes ISO/TS 21929-2, this document and a future standardization work on systems of indicators for different civil engineering work typologies.

As a suite, they define a methodology that combines rigour, consistence and flexibility in the assessment of a wide range of civil engineering works.

<table>
<tr><td>Methodological basics</td><td colspan="3">ISO 15392 Sustainability in buildings and civil engineering works — General principles
ISO/TS 12720 Sustainability in buildings and civil engineering works — Guidelines on the application of the general principles in ISO 15392
ISO/TR 21932 Sustainability in buildings and civil engineering works — A review of terminology
ISO 20887 Sustainability in buildings and civil engineering works — Design for disassembly and adaptability of buildings

ISO 21929-1 Sustainability in building construction — Sustainability indicators — Part 1: Framework for the development of indicators and a core set of indicators for buildings
ISO/TS 21929-2 Sustainability in building construction — Sustainability indicators — Part 2: Framework for the development of indicators for civil engineering works</td></tr>
<tr><td>Construction works</td><td>ISO 16745-1Sustainability in buildings and civil engineering works — Carbon metric of an existing building during use stage — Part 1: Calculation, reporting and communication

ISO 16745-2 Sustainability in buildings and civil engineering works — Carbon metric of an existing building during use stage— Part 2: Verification</td><td></td><td></td></tr>
<tr><td></td><td colspan="3">ISO 21931-1 Sustainability in buildings and civil engineering works — Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment — Part 1: Buildings

ISO 21931-2 Sustainability in buildings and civil engineering works — Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment —Part 2: Civil engineering works</td></tr>
<tr><td>Construction products and services</td><td>ISO 21930 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services</td><td></td><td></td></tr>
<tr><td></td><td>Environmental aspects</td><td>Economic aspects</td><td>Social aspects</td></tr>
</table>

Figure 1 — Suite of related documents for sustainability in buildings and civil engineering works

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Sustainability in buildings and civil engineering works — Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment —

Part 2: Civil engineering works

1 Scope

This document provides a general framework for improving the quality and comparability of methods for assessing the contribution of civil engineering works and their related external works to sustainable development based on a life cycle approach.

This document aims to bridge the gap between regional and national methods for the assessment of the sustainability performance of civil engineering works by providing a common framework for their expression.

This document identifies and describes issues to be taken into account in the development and use of methods for the assessment of the sustainability performance for 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 both new and existing civil engineering works over their entire life cycle.

The object of assessment in this document is the civil engineering works itself and its area of influence.

NOTE 1 For example, the assessment includes any local civil engineering works beyond the immediate area of the civil engineering works; the transportation of the users of the civil engineering works; and the use and exploitation of the civil engineering works itself.

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.

This document excludes environmental, social and economic risk assessment, but the results of a risk assessment can be taken into consideration.

This document is intended to be used in conjunction with, and following the principles set out in, ISO 15392 and the ISO 14000 family of International Standards.

The evaluation of technical and functional performance of the civil engineering works is outside the scope of this document, but the technical and functional characteristics are considered within this framework by reference to the functional equivalent. The functional equivalent takes into account the technical and functional requirements and forms the basis for comparisons of the results of the assessment.

Assessment methods that consider only one or two of the three dimensions of sustainability are outside the scope of this document.

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