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Second edition
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Sustainability in buildings and civil engineering works — General principles

*Développement durable dans les bâtiments et ouvrages de génie
civil — Principes généraux*



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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*.

This second edition cancels and replaces the first edition (ISO 15392:2008), which has been technically revised.

The main changes compared to the previous edition are as follows:

- The title and scope of the document have been updated to reflect that it applies to both buildings and civil engineering works.
- This scope of the document has been clarified to state that it identifies and establishes general principles for the contribution of buildings, civil engineering works and other types of construction works to sustainable development.
- The list of objectives for applying the concepts to sustainability and promoting sustainable development has been expanded to include additional considerations.
- The list of nine general principles has been updated to: continual improvement, equity, global thinking and local action, holistic approach, involvement of interested parties, long-term consideration and resilience, responsibility, risk management, and transparency.
- A description and additional explanatory information has been added for each principle.
- The concept of resilience was added as a key consideration as part of the principle of long-term consideration.
- The former “precaution and risk” principle was changed to “risk management” and includes the concepts of precaution, prevention, elimination, reduction and mitigation.
- Application of the general principles as they relate to the three pillars of sustainability, economic, social and environmental, along with integrated consideration of all aspects has been expanded.

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- A new section providing basic guidance for the application of each principle has been added.
- [Annex A](#) was updated with new designations, titles and short description of the suite of documents under ISO/TC 59/SC 17.
- Informative Annex B 'Products of the building and construction sector' was replaced by a new informative [Annex B](#) 'Guidance provided by the ISO 15686 series for service life planning in buildings and constructed assets'.

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.

Introduction

This document presents the concept of sustainability and the related general principles relevant to the design and decision-making processes associated with buildings, civil engineering works and other types of construction works. These general principles form the basis for a suite of standards intended to address specific issues, impacts and aspects related to the contribution of construction works to sustainable development. This document translates general aims and concepts of sustainable development to the construction industry, while adapting them to the constraints specific to the design, construction and management of buildings, civil engineering works and other types of construction works.

The issue of sustainable development is broad and of global concern, and, as such, involves all communities and other interested parties. This document considers the effects of design, construction and management of buildings and other types of construction works on the environment, economy and society, thereby implicating the ecological, economic and social dimensions of sustainable development. Both current and future needs define the extent to which these aspects and impacts can contribute to sustainable development.

The built environment, composed primarily of buildings and civil engineering works, has significant impacts on the environment in which society lives and works. It is a key element in determining quality of life and contributes to cultural identity and heritage.

The construction sector is highly important for sustainable development because:

- it is a key sector in national economies;
- it has a significant interface with poverty reduction through the basic economic and social services provided in the built environment and the potential opportunities for disadvantaged communities to be engaged in construction, operation and maintenance;
- it is one of the single largest industrial sectors and, while providing value and employment, it absorbs considerable resources, with consequential impacts on economic and social conditions and the environment;
- it creates the built environment, which represents a significant share of the economic assets of individuals, organizations and nations, providing societies with their physical and functional environment;
- it has a considerable opportunity to show improvement relative to its economic, environmental and social impacts.

Construction activities may or may not take place within a legal and regulatory or other administrative framework present within a country or region. In either case, aspects of governance are relevant to sustainable development, in addition to those aspects related specifically to buildings and civil engineering works. Well-established administrative frameworks may contain requirements that can act as drivers and help to move the building and construction sector towards sustainable development.

The contribution to sustainable development made by buildings and civil engineering works during their life cycle relates to the functional and technical performance, as well as the effect on the environment (environmental performance), the cost and value (economic performance) and the social effects on relevant stakeholders (social performance). In addition, the processes of design, construction and management, including related decision-making, are considered.

The challenge of sustainable development is global; targets and relevant indicators may be derived from both internationally agreed United Nations Sustainable Development Goals (UN SDGs)¹⁾, the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement²⁾, as well as the area(s) of concern specifically under consideration. The strategies for addressing sustainability within buildings, civil engineering works and other construction works are essentially local and differ in

1) <https://sustainabledevelopment.un.org>

2) <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

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context and content from region to region. These strategies reflect the context, the preconditions and the priorities and needs, not only in the built environment and the local economy, but also in the social environment. This social environment includes social equity, cultural issues, traditions, heritage issues, human health and comfort, social infrastructure and safe and healthy environments. In developing countries, it may also include poverty reduction, job creation, access to safe, affordable food, water and shelter, and creation or preservation of livelihoods. The utilization of resources and associated effects on global and local environments are considered when assessing overall environmental impacts. Life cycle costs and the effects on the value of constructed assets are taken into account during consideration of economic consequences. Additionally, the cost of externalities may be considered from a macroeconomic point of view.

Applying the principles of sustainability in the context of construction works, including all related processes and activities, requires the direct and responsible involvement of all interested parties. While their legal responsibility and liability is subject to national or regional regulation, individual commitment and responsibility is voluntary. Nevertheless, this commitment is a basic principle of the application of sustainable development, including application in the building and construction sector.

Applying the concept of sustainability to specific buildings and civil engineering works includes a holistic approach, bringing together the global concerns and goals of sustainable development and the demands and requirements in terms of product functionality, efficiency and economy. Different target audiences have different perspectives on these challenges and the preferred solutions.

This document establishes internationally recognized principles for sustainability in the context of buildings, civil engineering works and other construction works and establishes a common basis for communication of the information required. Interested parties, such as product manufacturers and designers, are then able to provide information in accordance with these general principles. Such information can then be communicated to a wide range of target audiences, extending from policy makers and regulators to manufacturers, asset owners and consumers. The recipients of the information can elaborate upon and interpret this information according to their own context, intended use and target audiences.

The concepts involved in sustainability are highly complex and under constant study. There are no definitive methods for measuring sustainability or confirming its accomplishment. These general principles do not provide a benchmark against which a claim of sustainability can be made. Nevertheless, they can be useful when considering the completeness and validity of claims of, or calls for, sustainability or contributions to sustainable development in the context of buildings, civil engineering works and other construction works.

The aim of this document is to set out the objectives for sustainability in the context of all types of construction works and from these objectives, derive general principles for achieving them. This document forms the basis for deriving evaluation criteria and indicators for the assessment of the contribution of buildings and civil engineering works to sustainable development, and it enables decision makers to apply the principles in their decision-making processes. While this document remains at the level of identifying the objectives and principles for sustainability, relative to buildings, civil engineering works and other types of construction works, more detailed guidance on the application of these general principles is found within ISO/TS 12720.

This document does not set the political agendas, or provide priorities related to specific concerns that are established in international frameworks, such as the UN SDGs. However, requirements and targets related to political goals can be related to the identified general principles for sustainability in buildings and other types of construction works.

This document is one in a suite of International Standards developed under ISO/TC 59/SC 17, dealing with sustainability in buildings and civil engineering works, that includes the following:

- a) This document;
- b) ISO/TS 12720;
- c) ISO/TR 21932;

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- d) ISO 21929-1;
- e) ISO/TS 21929-2;
- f) ISO 21931-1;
- g) ISO 21931-2;
- h) ISO 16745-1;
- i) ISO 16745-2;
- j) ISO 21930;
- k) ISO 20887³⁾;
- l) ISO 21678⁴⁾.

3) Under preparation. Stage at the time of publication: ISO/FDIS 20887:2019.

4) Under preparation. Stage at the time of publication: ISO/DIS 21678:2019.

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	environmental aspects	social aspects	economic aspects	technical aspects	functional aspects
ISO/TC59/SC17					
Principles	<p>ISO 15392 General principles</p> <p>ISO TS 12720 Guideline on the application of ISO 15392</p> <p>ISO TR 21932 Terminology</p> <p>ISO 21929-1 Framework for the development of Indicators – Part 1: Buildings</p> <p>ISO 21929-2 Framework for the development of Indicators – Part 2: CEW</p> <p>ISO 21931-1 Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment – Part 1: Buildings</p> <p>ISO 21931-2 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</p> <p>ISO 20887 Design for Disassembly and adaptability - Principles, requirements and guidance</p>				
Buildings (Parts 1) + Civil Engineering Works, CEW (Parts 2)	<p>ISO 16745-1+ 2 Carbon metric of an existing building during use stage. Part 1: Calculation, reporting, communication. Part 2: Verification</p> <p>ISO 21678 Methodological principles for the development of benchmarks for sustainable buildings</p>				
Products	<p>ISO 22057 Enabling use of Environmental Product Declarations (EPD) at construction works level using building information modelling (BIM)</p> <p>ISO 21930 Core rules for environmental product declarations of construction products and services</p>				

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

NOTE For a description of the suite of International Standards, see [Annex A](#). This suite of standards currently contains the documents indicated in [Figure 1](#).

Intended users of the suite of International Standards include (in alphabetical order): builders, certification bodies, clients, contractors, designers, developers, facility managers, fund providers, governmental and non-governmental organizations, insurers, manufacturers, owners, planners, policy makers, promoters, real estate agents, regulators, researchers, standards developers, users (tenants, as well as the public), etc.

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The guidance provided in ISO Guide 82:2014 was considered for the update of this document.