ISO/TS 21929-2

TC 59/SC 17

Sustainability in building construction

Sustainability indicators

Part 2 : Framework for the development of indicators for civil engineering works

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Executive summary

Although the ISO portfolio already comprises of a number of standards dealing with sustainability for buildings, this is the first publication dealing with sustainability for civil engineering works (e.g. road construction, dams, maritime works). It will contribute to improving the related design and decision process and help in the monitoring, measurement and evaluation of the sustainability of civil engineering works throughout their life-cycles.

It will also contribute to demonstrating that the civil engineering works sector feel socially responsible and to gathering supporting data for communication and marketing strategies.

It is intended to be used in the

- design and decision making process during the planning and design stage of civil engineering works,
- development and application of assessment methods and certification systems,
- specification and verification of environmental and social requirements in the context of procurement,
- indicating of civil engineering performance (e.g. marketing),
- measuring, monitoring or evaluating of the performance and achievement of sustainability objectives over the different life cycle stages of the civil engineering works, and
- representing of activities and results in the context of responsibility towards economy, environment and society (e.g. sustainable development reporting).

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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. www.iso.org/directives

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 59, *Buildings and civil engineering works*, SC 17, *Sustainability in buildings and civil engineering works*.

ISO 21929 consists of the following parts, under the general title Sustainability in buildings and civil engineering works — Sustainability indicators:

— *Part 1: Framework for the development of indicators and a core set of indicators for buildings*

— *Part 2: Framework for the development of indicators for civil engineering works* [Technical Specification]

Introduction

This part of ISO 21929 describes and gives guidelines for the development of sustainability indicators related to civil engineering works and defines the aspects and impacts of civil engineering works to consider when developing systems of sustainability indicators.

These guidelines form a basis for the suite of ISO/TC 59/SC 17 standards intended to address specific issues and aspects of sustainability relevant to construction works. The issue of sustainable development is broad and of global concern, and, as such, involves all communities and interested parties. Both current and future needs define the extent to which economic, environmental and social aspects are considered in a sustainable development process.

The built environment (buildings and civil engineering works) is a key element in determining quality of life, and contributes to cultural identity and heritage. As such, it is an important factor in the appreciation of the quality of the environment in which society lives and works.

The building and 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 provision of improved basic economic and social services within the built environment.

— it is one of the single largest industrial sectors and, while providing value and employment, it uses considerable resources and contributes to the transformation of areas, 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 considerable opportunity to show improvement relative to its economic, environmental and social impacts.

While the challenge of sustainable development is global, the strategies for addressing sustainability in civil engineering works are essentially local and differ in 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, 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.

It can, in addition, particularly in developing countries, include poverty reduction, job creation, access to safe, affordable and healthy shelter, and loss of livelihoods.

This part of ISO 21929 defines a framework for the development of sustainability indicators for civil engineering works based on the premise that civil engineering works contribute to sustainable development about the required performance and functionality

with minimum adverse environmental impact, while encouraging improvements in economic and social (and cultural) aspects at local, regional and global levels.

This part of ISO 21929 follows the general principles presented in ISO 15392.

Indicators are figures or other qualitative or descriptive measures that enable information on a complex phenomenon, like environmental impact, to be simplified into a form that is relatively easy to use and understand.

The three main functions of indicators are quantification, simplification and communication. Targets can also be set with the help of indicators. Changes in a civil engineering works over time and the development of changes in relation to stated objectives can be monitored with the help of indicators. One of the important functions of an indicator with reference to decision-making is its potential to show a trend.

When developing and selecting indicators, the starting point is the identification of the main users and user needs. Sustainability indicators for civil engineering works are needed in decision-making by a number of interested parties, such as

a) public bodies and policy makers,

b) investors, owners and promoters,

c) planners, developers and designers,

d) governmental and non-governmental organizations (considering interest groups both at national and at local level),

e) manufacturers of products,

f) contractors,

g) operators and maintainers,

h) users and other stakeholders who are given service by the infrastructure, and

i) nearby local residents.

The civil engineering and construction sector needs sustainability indicators both for its own decision-making within design, production and management as well as for indicating to the public and to clients the economic, environmental or social impact of civil engineering works, their products and related processes.

Indicators, as well as sets and systems of indicators, for the specification, assessment and representation of the contribution of a civil engineering works to sustainable development can be used in many different ways. For example, among others, their application can support the following:

— design and decision making process(es) during the planning, and design stage of a civil engineering works (e.g. incorporation in the design of sustainable material, technologies, processes and other components).

— development and application of assessment methods and certification systems.

— specification and verification of environmental and social requirements in the context of procurement.

— indicating the civil engineering performance (e.g. marketing).

— measuring, monitoring or evaluating the performance and achievement of sustainability objectives over the different life cycle stages of the civil engineering works.

— accepting responsibility for impacts on the environment and the society.

— representation of activities and results in the context of responsibility towards

— the economy, environment and society (e.g. sustainable development reporting).

NOTE The monitoring and evaluation of objectives can contribute to the continual improvement related to a specific or group of civil engineering works.

This part of ISO 21929 is one in a suite of International Standards dealing with sustainability in buildings and civil engineering works, which includes ISO 15392, ISO 21929-1, ISO 21930, ISO 21931-1, along with the terminology of sustainability in buildings and civil engineering works (ISO/TR 21932).

The relationship among the International Standards is shown in Figure 1.

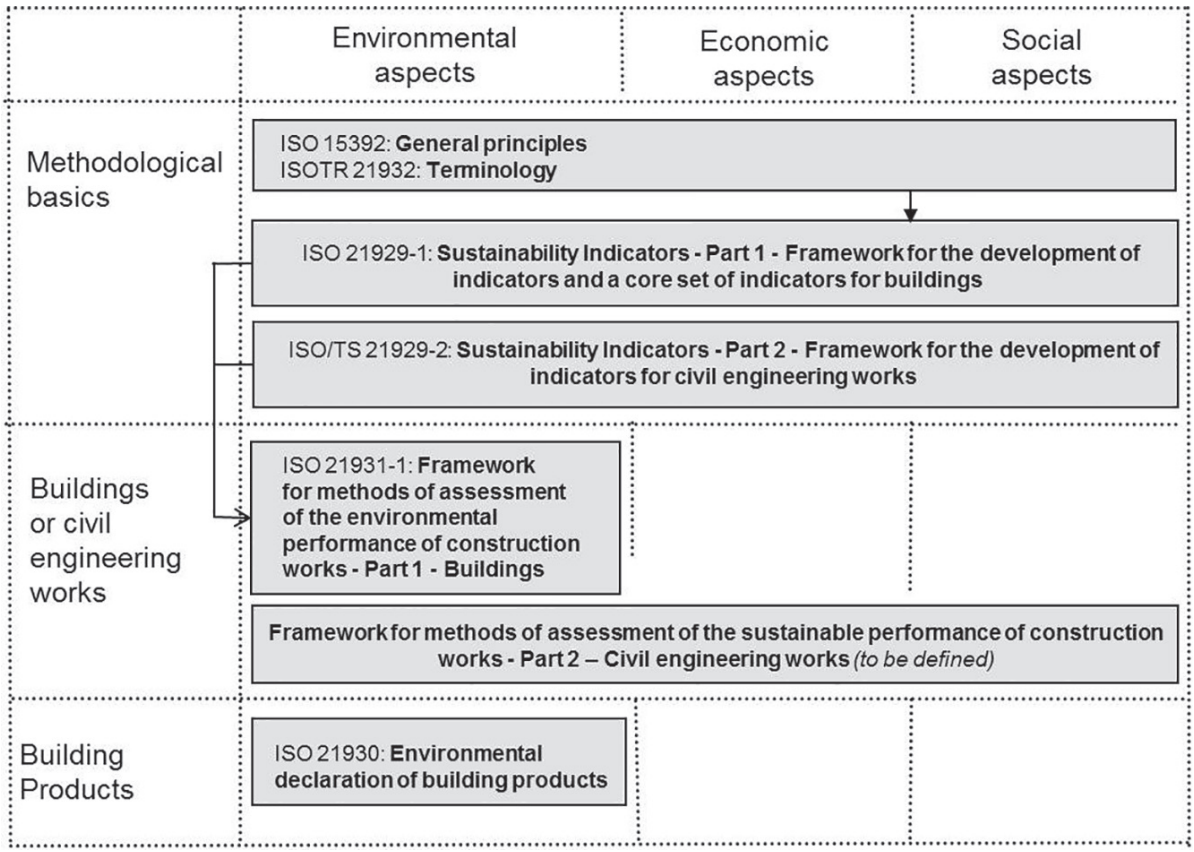

Figure 1 — Suite of related International Standards for sustainability in buildings and civil engineering works