INTERNATIONAL STANDARD

ISO 12006-2

Redline version
compares Second edition to
First edition

Building construction — Organization of information about construction works —

Part 2: Framework for classification

Construction immobilière — Organisation de l'information des travaux de construction —

Partie 2: Plan type pour la classification

Reference number
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 — indicates added graphic figure

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1.x ... — Heading numbers containg modifications are highlighted in yellow in the Table of Contents

All changes in this document have yet to reach concensus by vote and as such should only be used internally for review purposes.

DISCLAIMER

This Redline version provides you with a quick and easy way to compare the main changes between this edition of the standard and its previous edition. It doesn't capture all single changes such as punctuation but highlights the modifications providing customers with the most valuable information. Therefore it is important to note that this Redline version is not the official ISO standard and that the users must consult with the clean version of the standard, which is the official standard, for implementation purposes.

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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.

~~International Standards are~~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 ~~rules given in~~editorial rules of the ISO/IEC Directives, Part ~~3~~2 (see www.iso.org/directives).

~~The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.~~

Attention is drawn to the possibility that some of the elements of this ~~part of~~document ~~ISO 12006~~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 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.

~~ISO 12006-2 was prepared by Technical Committee~~The committee responsible for this document is ISO/TC 59, ~~*Building construction*~~*Buildings and civil engineering works*, Subcommittee SC 13, *Organization of information about construction works*~~.~~.

This second edition cancels and replaces the first edition (ISO 12006-2:2001), which has been technically revised.

ISO 12006 consists of the following parts, under the general title *Building construction — Organization of information about construction works*:

— *Part 2: Framework for classification* ~~*of information*~~

— *Part 3: Framework for object-oriented information* ~~*exchange*~~

~~Annex~~Annexes A and B of this part of ISO 12006 ~~is~~are for information only.

Introduction

0.1 The status quo

At present there is little international standardization of classifications for construction. The construction industries of individual countries, even adjacent countries, have tended to remain separate because of differences of culture and legislation, and each has developed its own methods of arranging information. National classifications can be difficult to change and there may seem insufficient reason to do so.

The most widely used classifications are work sections (mainly for specifications) and elements (mainly for cost analysis). They are also the most widely varied, not only in their itemization and structure but also in the range of other purposes to which they are put. There are other classifications, potentially just as important, which have not yet been used to the same degree, e.g. construction products and properties/characteristics.

0.1 Background

0.2 The need for standardization

Modern information systems for the construction industry, whether local or networked, need to handle data of many different types, e.g. geometrical data, technical properties, cost data, maintenance data, for use within different applications such as CAD, specification, product information and cost information systems. All these data and the relations between them need to be defined and structured in such a way that the stored information is consistent and reliable within and between the different applications.

This part of ISO 12006 was first produced when there was little international standardization of classification systems for construction. Now, several national classification systems have been developed, for example, in North America, Scandinavia, and the UK, that implement the 2001 edition. Lessons learned in these implementations have been applied in this second edition.

0.3 Other work of relevance

The following groups specifically address the issue of computerized exchange of data.

— ISO/TC 184, *Industrial automation systems and integration*, SC 4, *Industrial data* (STEP – Standard for the Exchange of Product model data). STEP is a standard for computer-interpretable representation and exchange of product data. Exchange of information has been initiated between those working in TC 184/SC 4 on the Building Construction Core Model (BCCM) and TC 59/SC 13 for co-ordination of basic construction information concepts.

— UN/EDIFACT with its regional organizations, e.g. EBES (European Board for EDI Standards) and PAEB (Pan American EDIFACT Board). Groups concerned specifically with the construction industry are, at a global level, JM7 AEC and, at a European level, EBES EEG05 (EBES Expert Group 05 AEC), the latter working within the European user group EDIBUILD.

— ISO/TC 59/SC 13 has started work on a framework for object-oriented information exchange in the construction industry.

— ISO/TC 10/SC 8 has produced ISO 13567-1, ISO 13567-2 and TR 13567 on the organization and naming of layers for CAD.

— IAI (International Alliance for Interoperability) is an international body which is developing Industry Foundation Classes, an industry standard for holding and exchanging digital data.

This part of ISO 12006 has also been revised to take into account developments in information technology (notably building information modelling) and construction procurement (for example, design-build and design-build-operate). It has been extended and definitions have been refined to better serve all

construction sectors, including building, civil engineering, and even process engineering. However, it continues to serve traditional information technologies and procurement methods.

A survey conducted as part of the work towards this edition showed that the most widely used classifications remain work results (mainly for specifications) and elements (mainly for cost analysis). They are also the most widely varied classification tables not only in their itemization and structure but also in the range of purposes to which they are put. There are other classifications, potentially just as important, which are used to a lesser degree, e.g. for construction products and properties.

0.2 The need for standardization

Building information modelling and modern forms of procurement require all these construction object classes to be used, along with many others. Building information modelling, in particular, is about exchange of information of all types along the project time line and between participants and applications. This is also the case for cooperative forms of procurement. For this exchange to be successful, a complete and consistent approach to construction object classification is required within the project, and between projects. This part of ISO 12006 is intended to facilitate this exchange.

Information types include geometrical data, functional and technical data, and cost data and maintenance data. The project timeline runs from inception to eventual demolition. Participants include clients, designers, authorities, constructors, end users, and operators. Applications include modelling, specification, product information, and cost information systems. Even now, there is still pressure for each of these to retain, or even develop, its own classification silo. This is not sustainable.

While national classifications that implement this part are still likely to differ in their detail (for example, due to differences in construction culture and legislation), mapping between them should be fairly straightforward. This is because they will be using the same overarching classification framework and construction object class definitions. This, in turn, will help with international construction project work (with participants from many countries), and with development of applications intended to be used internationally.

0.3 The content of this part

This part of ISO 12006 defines a framework for construction-sector classification systems and identifies a set of recommended classification tables and their titles for a range of construction object classes according to particular views, supported by definitions.

Building construction — Organization of information about construction works —

Part 2: Framework for classification

1 Scope

This part of ISO 12006 defines a framework for the development of built environment classification systems. It identifies a set of recommended classification table titles for a range of information object classes according to particular views, e.g. by form or function, supported by definitions. It shows how the object classes classified in each table are related, as a series of systems and sub-systems, e.g. in a building information model.

This part of ISO 12006 ~~defines a framework and a set of recommended table titles supported by definitions, but not the detailed content of these tables~~does not provide a complete operational classification system, nor does it provide the content of the tables, though it does give examples. It is intended for use by organizations which develop and publish such classification systems and tables ~~on a national or regional basis.~~, which may vary in detail to suit local needs. However, if this part of ISO 12006 is applied in the development of local classification systems and tables, then harmonization between them will be facilitated.

This part of ISO 12006 applies to the complete life cycle of construction works, including briefing, design, ~~production, maintenance and demolition, and~~documentation, construction, operation and maintenance, and demolition. It applies to both building and civil engineering works, including associated engineering services and landscaping.

~~It identifies classes for the organization of information and indicates how these classes are related.~~

~~This part of ISO 12006 lists the tables which are recommended to be developed and used to classify the members of each class according to particular views or principles of specialization and gives examples of entries which might occur in these tables.~~

~~It does not provide a complete operational classification system. Classification tables may vary in detail to suit local needs.~~

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.

ISO 22274, *Systems to manage terminology, knowledge and content — Concept-related aspects for developing and internationalizing classification systems*

~~2~~3 Terms and definitions

~~For the purposes of this part of ISO 12006, the following terms and definitions apply.~~

3.1 General

For the purposes of this document, the following terms and definitions apply.

NOTE 1 The definitions are arranged in the following order: construction resource, construction process, construction result, and construction properties.

NOTE 2 In the definitions, terms that are defined elsewhere within this clause are shown in *italics*.

NOTE 3 Examples are given in Annex A.

3.1.1
object
any part of the perceivable or conceivable world

Note 1 to entry: An object is something abstract or physical toward which thought, feeling, or action is directed.

3.1.2
construction object
object (3.1.1) of interest in the context of a *construction process* (3.3.2)

3.1.3
construction system
interacting *construction objects* (3.1.2) organized to achieve one or more purposes

Note 1 to entry: Construction systems can be classified in accordance with this International Standard.

[SOURCE: ISO/IEC 15288:2008, modified]

3.1.4
type-of relation
relation between two concepts where the intention of one of the concepts includes that of the other concept and at least one additional delimiting characteristic

Note 1 to entry: Type-of relation is also known as generic relation.

[SOURCE: ISO 1087-1:2000, 3.2.21]

3.1.5
part-of relation
relation between two construction objects where one object constitutes the whole and the other a part of that whole

Note 1 to entry: Part-of relation is also known as partitive relation, part-whole relation, or whole-part relation.

Note 2 to entry: See also ISO/IEC 81346-1.

[SOURCE: ISO 1087-1:2000, 3.2.22, modified]

3.1.6
natural environment
non-artificial environment of any physical *construction object* (3.1.2)

3.1.7
built environment
physical *construction result* (3.4.6) intended to serve a function or user activity

Note 1 to entry: The built environment may be viewed as a system of either built space or built structure.

3.1.8
space
limited three-dimensional extent defined physically or notionally

3.1.9
activity space
space (3.1.8) defined by the spatial extension of an activity

Note 1 to entry: A spatial extension of an activity, for example, a table or a bed, and the activity space around them.

~~**2.1**~~
~~**object**~~
~~any part of the perceivable or conceivable world~~

3.2 Construction resource

3.2.1
construction agent
human *construction resource* (3.2.5) carrying out a *construction process* (3.3.2)

3.2.2
construction aid
construction resource (3.2.5) intended to assist in carrying out a *construction process* (3.3.2)

Note 1 to entry: A construction aid is generally not intended for incorporation in a permanent manner in a construction entity.

3.2.3
construction information
information of interest in a *construction process* (3.3.2)

Note 1 to entry: Construction information may be seen both as a construction resource and as a construction result.

3.2.4
construction product
product intended to be used as a *construction resource* (3.2.5)

Note 1 to entry: Construction products have different complexity and can, by themselves or together with others, make up the parts in any level of assembly of construction entities.

3.2.5
construction resource
construction object (3.1.2) used in a *construction process* (3.3.2) to achieve a *construction result* (3.4.6)

~~**2.2**~~
~~**construction object**~~
~~object of importance to the construction industry~~

3.3 Construction process

3.3.1
construction activity
component process of construction process

3.3.2
construction process
process which uses *construction resources* (3.2.5) to achieve *construction results* (3.4.6)

Note 1 to entry: Each construction process may be split up into its component processes.

Note 2 to entry: See also ISO 22263:2008.

3.3.3
construction process lifecycle
sequence of stages from the start to the end of the *construction process* (3.3.2)

3.3.4
pre-design process
construction process (3.3.2) determining *construction properties* (3.5.1) for the *built environment* (3.1.7) before it is designed

3.3.5
design process
construction process (3.3.2) determining *construction properties* (3.5.1) for the *built environment* (3.1.7) before it is made physical

3.3.6
production process
construction process (3.3.2) resulting in *built environment* (3.1.7)

Note 1 to entry: Production process includes demolition and recycling process.

3.3.7
maintenance process
construction process (3.3.2) preserving the function of, or operating, the *built environment* (3.1.7)

3.3.8
management
control activity in a *construction process* (3.3.2) by one or more *construction agents*

~~**2.3**~~
~~**construction result**~~
~~construction object which is formed or changed in state as the result of one or more construction processes utilizing one or more construction resources~~

~~EXAMPLE Office building, installed reinforcement bar, ventilation system, bridge, asphalt surface, enclosed space.~~

~~Note 1 to entry: A construction result need not have a physical existence, e.g. a "designed" office building is a construction result, even though it has not yet been constructed, similarly a "demolished" office building is a construction result, even though it no longer has a physical existence.~~

~~Note 2 to entry: A manufactured "reinforcement bar" is a construction resource until it has been acted upon by a construction process, after which it becomes a construction result. In other words an installed "reinforcement bar" is a construction result, but a "reinforcement bar" in storage in a manufacturer's warehouse is a construction resource.~~

3.4 Construction result

3.4.1
construction complex
aggregate of one or more *construction entities* (3.4.2) intended to serve at least one function or user activity

Note 1 to entry: A construction complex can be analysed and the construction entities that go to make it up, can be identified; e.g. an airport typically is composed of the construction entities runway, control tower, terminal building, aircraft hangar, etc. A business park typically is composed of a number of buildings, access roads, and landscaping (each a construction entity in its own right). A motorway from A to B typically is composed of service stations, the motorway pavement, bridges, embankments, landscaping, etc.

3.4.2
construction entity
independent unit of the *built environment* (3.1.7) with a characteristic form and spatial structure, intended to serve at least one function or user activity

Note 1 to entry: A construction entity is the basic unit of the built environment. It is recognizable as a physically independent construction even though a number of construction entities might be seen as parts of a particular construction complex. Ancillary works such as access roads, landscaping, service connections, may be regarded as part of a construction entity. Conversely, when ancillary works are of sufficient scale, they may be regarded as construction entities in their own right.

3.4.3
construction element
constituent of a *construction entity* (3.4.2) with a characteristic function, form, or position

Note 1 to entry: For practical purposes, such as when carrying out a cost analysis of a construction entity, it is vital that construction elements are mutually exclusive, in order to ensure that each part is counted once and only once.

3.4.4
built space
space (3.1.8) defined by *built* (3.1.7)*or natural environment* (3.1.6) or both, intended for user activity or equipment

Note 1 to entry: A built space is, for example, a room defined by floor, ceiling, and wall, or a footpath, or power-line corridor defined by a natural forest.

Note 2 to entry: Spaces occupied by construction elements are known as construction spaces, and are handled as properties of construction elements themselves.

3.4.5
zone
space (3.1.8) or spaces with a particular function

Note 1 to entry: Zones may be defined by physical or notional properties, e.g. fire safety zone, climate zone, smoking area, and quiet zone.

3.4.6
construction result
construction object (3.1.2) which is formed or changed in state as the result of one or more *construction processes* (3.3.2) using one or more *construction resources* (3.2.5)

3.4.7
construction result lifecycle
period of time from inception to the demolition of a *construction result* (3.4.6)

3.4.8
work result
view of *construction result* (3.4.6) by type of work activity and resources used

Note 1 to entry: A production work result can be enabling, creating resources.

~~**2.4**~~
~~**construction entity**~~
~~independent material construction result of significant scale serving at least one user activity or function~~

~~EXAMPLE Building, bridge, road, dam, tower, sewer, museum (if a single structure), sports field, sewage settlement tank, cycleway.~~

Note 1 to entry: A construction entity is the basic unit of the built environment. It is recognizable as a physically independent construction even though a number of construction entities might be built as parts of a particular construction complex. Ancillary works such as access roads, landscaping, service connections, may be regarded as part of a construction entity. Conversely, when ancillary works are of sufficient scale they may often be regarded as construction entities in their own right.

3.5 Construction property

3.5.1
construction property
property of a *construction object* (3.1.2)

2.5
construction complex
two or more adjacent construction entities collectively serving one or more user activity or function

EXAMPLE Air port, sewage treatment works, business park, port, motorway, shopping and sports complexes.

Note 1 to entry: A construction complex can be analysed and the construction entities that go to make it up, identified, e.g. an airport typically is composed of the construction entities runway, control tower, terminal building, aircraft hangar, etc. A business park typically is composed of a number of buildings, access roads and landscaping (each a construction entity in its own right). A motorway typically is composed of service stations, the motorway pavement, bridges, embankments, landscaping, etc.

2.6
construction entity part
solid (as distinct from liquid or gaseous), material part of a construction entity, having physically delineated boundaries

EXAMPLE Wall, door, door handle, wash basin, road surface, bridge pier, pipeline valve, light switch, roof, heating system, sluice gates.

2.7
element
construction entity part which, in itself or in combination with other such parts, fulfils a predominating function of the construction entity

EXAMPLE 1 (element). External wall, floor, roof, foundation, column, lighting system, ventilation system, culinary furnishings, sanitary equipment.

EXAMPLE 2 (predominating function). Space enclosing, supporting, servicing, furnishing.

Note 1 to entry: For practical purposes, such as when carrying out a cost analysis of a construction entity, it is vital that elements be defined as exhaustive and mutually exclusive, in order to ensure that each part is counted once and only once. Where an element contributes to more than one of the predominating functions of the construction entity, such as an internal wall that provides support as well as enclosing space, for the purposes of an element table one of these must be designated the "characteristic" predominating function. By "characteristic" is meant "generally the most significant".

Note 2 to entry: In the case of internal walls of buildings "space enclosing" may be chosen because not all such walls provide structural support and, during the early stages of design, it may not be known whether a wall will be load-bearing or not. Conversely, it may be considered advantageous to regard load-bearing and non-load-bearing internal walls as distinct elements, the first being classified under the predominating function "supporting" and the second classified under "space enclosing".

Note 3 to entry: An element is fundamentally different from a construction entity part, e.g. when constructing a classification table for construction entity parts, the objects listed below are likely to be defined as types of "wall". However, their characteristic functions (given in parentheses) are quite different. Therefore when constructing a classification table for elements, they will not be grouped together.

— Wall forming external boundary of building (enclosing habitable space).

— Under-building wall (supporting the building, as part of foundations).

