



**International
Standard**

ISO 7817-1

**Building information modelling —
Level of information need —**

Part 1:

Concepts and principles

*Modélisation des informations de la construction (BIM) — Niveau
du besoin d'information —*

Partie 1: Concepts et principes

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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 document 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).

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This document was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 13, *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM)*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 442, *Building Information Modelling (BIM)*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 7817 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.

Introduction

This document sets out the concepts and principles for defining the level of information need and information deliveries which form part of the information exchange processes during the life cycle of built assets when using building information modelling (BIM). These concepts and principles can deliver clear benefits to all participants in the various life cycle phases of built assets as they provide a common understanding on the right level of information needed at a certain time. One purpose of defining the level of information need is to prevent delivery of too much information. Information exchange should ensure the required information to be delivered at the agreed time for the agreed purpose to facilitate verification and validation processes.

This document provides methods for describing information to be exchanged according to exchange information requirements. The exchange information requirements specify the wanted information exchange. The result of this process is an information delivery.

There is a need that these concepts and principles are described in a common and comparable way to allow services related to building information modelling to be procured and offered on a global scale. The need has arisen by the fact that there are several conflicting terms, concepts and usages in place, internationally, that hinder the objective of having a common understanding and practise in describing the level of information need. It is therefore helpful not to use an acronym to refer to level of information need as this can oversimplify these concepts.

The concepts and principles contained in this document are aimed at all those involved in the asset life cycle. These include, but are not limited to, the asset owner/operator, the client, the asset manager, the design team, the construction team, an equipment manufacturer, a technical specialist, a regulatory authority, an investor, an insurer and an end-user.

The information exchange, as well as related topics such as the exchange information requirements and the information delivery are defined and explained in context of ISO 19650-1 and ISO 29481-1.

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Building information modelling — Level of information need —

Part 1: Concepts and principles

1 Scope

This document specifies concepts and principles to establish a methodology for specifying level of information need and information deliveries in a consistent way when using building information modelling (BIM).

This document specifies the characteristics of different levels used for defining the detail and extent of information required to be exchanged and delivered throughout the life cycle of built assets. It gives guidelines for principles required to specify information needs.

The concepts and principles in this document can be applied for a general information exchange and while in progress, for a generally agreed way of information exchange between parties in a collaborative work process, as well as for an appointment with specified information delivery.

This document is applicable to the whole life cycle of any built asset, including strategic planning, initial design, engineering, development, documentation and construction, day-to-day operation, maintenance, refurbishment, repair and end-of-life.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 29481-1, *Building information models — Information delivery manual — Part 1: Methodology and format*

ISO 6707-1, *Buildings and civil engineering works — Vocabulary — Part 1: General terms*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 29481-1, ISO 6707-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 information container

named persistent set of *information* (3.11) retrievable from within a file, system or application storage hierarchy

EXAMPLE Including sub-directory, information file (including model, document, table, schedule), or distinct subset of an information file such as a chapter or section, layer or symbol.

Note 1 to entry: Persistent information exists over a timescale long enough for it to have to be managed, i.e. this excludes transient information such as internet search results.

Note 2 to entry: Naming of an information container should be according to an agreed naming convention.

[SOURCE: ISO 19650-1:2018, 3.3.12, modified — Note 1 to entry has been removed; subsequent notes to entry have been renumbered.]

3.2

information delivery milestone

scheduled event for a predefined *information exchange* (3.3)

[SOURCE: ISO 19650-2:2018, 3.1.3.2]

3.3

information exchange, verb

act of satisfying an *information* (3.11) requirement or part thereof

[SOURCE: ISO 19650-1:2018, 3.3.7]

3.4

information model

set of structured and unstructured *information containers* (3.1)

[SOURCE: ISO 19650-1:2018, 3.3.8]

3.5

level of information need

framework which defines the extent and granularity of *information* (3.11)

Note 1 to entry: One purpose of defining the level of information need is to prevent delivery of too much information.

[SOURCE: ISO 19650-1:2018, 3.3.16]

3.6

verification

confirmation, through the provision of objective evidence, that specified requirements have been fulfilled

[SOURCE: ISO 9000:2015, 3.8.12, modified — Notes 1 to 3 to entry have been removed.]

3.7

validation

confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled

[SOURCE: ISO 9000:2015, 3.8.13, modified — Notes 1 to 3 to entry have been removed.]

3.8

breakdown structure

decomposition of a defined scope into progressive levels

[SOURCE: ISO 21511:2018, 3.13 modified — The word “work” has been deleted from the term; “scope of the project and programme” has been replaced with “scope”; “progressively lower levels consisting of elements of work” has been replaced with “progressive levels”.]

3.9

object

any part of the perceivable or conceivable world

[SOURCE: ISO 12006-2:2015, 3.1.1, modified — Note 1 to entry has been removed.]

3.10

geometry

shape, size and location of an *object* (3.9)

[SOURCE: ISO/IEC 13249-3:2016, 3.1.2.27, modified — The word “size” has been added; “geographic location” has been replaced with “location”; “feature” has been replaced with “object”.]

3.11

information

meaningful data

[SOURCE: ISO 9000:2015, 3.8.2]

3.12

geometrical information

information (3.11) expressed using *geometry* (3.10)

3.13

alphanumeric information

information (3.11) expressed using characters, digits and symbols or tokens

EXAMPLE Mathematical symbols and punctuation marks are such tokens.

3.14

documentation

collection of documents related to a given subject

[SOURCE: IEC 82045-1:2001, 3.2.4, modified — Notes 1 to 4 to entry have been removed.]

3.15

information deliverable

information container (3.1) used to fulfil an appointment

4 General

To support information exchange, level of information need should be used.

The level of information need provides a framework for describing information exchanged in terms of geometrical information, alphanumeric information and documentation. Different purposes have their own needs of geometrical information, alphanumeric information and documentation.

The level of information need should be used to discuss and agree on the information exchange between two or more actors.

The level of information need describes information requirements that can be human-readable and machine-interpretable.

5 Framework to specify the level of information need

5.1 General

In specifying the level of information need and how information is going to be delivered, the following prerequisites shall be considered:

- purposes of the information to be delivered;
- information delivery milestones for the delivery of the information;
- actors who are either information receivers or information providers of the information;
- objects organized in one or more breakdown structures.

The specification of level of information need is informed by but does not include the listed prerequisites (see also [Figure 8](#) in [6.5](#) for the relationship between the prerequisites and the level of information need).

See [Annex A](#) for more information related to the conceptual relationships between this document, ISO 19650-1 and ISO 29481-1.

5.2 Consider the purposes

In specifying the level of information need, the purposes for information delivery shall be considered.

The purposes should be specified to clarify why the information is needed. The level of information need should be used for the purposes it has been required for.

The level of information need does not specify the purposes.

To achieve the same purpose, the geometrical information, alphanumerical information and documentation can vary for different objects.

EXAMPLE 1 To perform an accessibility analysis, properties such as the clear opening width of a door, its location, the position and shape of the handle are needed. Other properties, such as the name of the manufacturer and the acquisition cost, are not relevant to fulfil the purpose. On the other hand, for cost analysis purpose, the acquisition cost of a door is needed, but the appearance of the handle is not relevant. For rendering purpose, the geometrical appearance of a door is relevant, while the name of the manufacturer and the acquisition cost are not.

At an information delivery milestone, the same level of information need required for an object can be used for different purposes.

EXAMPLE 2 In concept design, the same geometry and information of a block can be used for clash detection and quantity take off.

In some cases, the purpose should not be explicit to all actors (e.g. for security reasons). In those cases, the purpose should be considered as “not disclosed” and only authorized actors should be informed.

NOTE The purposes can be extracted from organizational information requirements, project information requirements and asset information requirements as described in ISO 19650-1:2018, 5.2, 5.3, 5.4 and ISO 19650-2:2018, 5.1.2.

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5.3 Consider the information delivery milestones

In specifying the level of information need, information delivery milestones shall be considered.

The information delivery milestones should be specified to clarify when the information is needed.

The level of information need does not specify the information delivery milestones.

At the same information delivery milestone, the geometrical information, alphanumerical information and documentation can vary for different objects.

EXAMPLE 1 To do accessibility analysis, usually the same level of information need is required at different milestones.

EXAMPLE 2 To do energy analysis, different level of information need is required at different milestones.

5.4 Consider the actors

In specifying the level of information need, actors who receive and provide the information shall be considered.

The level of information need does not specify the actor (actors).

NOTE 1 The same level of information need can be required by different actors at the same milestone to fulfil different purposes.

NOTE 2 Different level of information need can be required by different actors at the same milestone to fulfil the same purpose.

NOTE 3 At different milestones, e.g. especially in the early phase, it is possible that the actor responsible for delivering specified level of information need is not specified.

EXAMPLE 1 A client can ask for a specific level of information need for an object at an agreed information delivery milestone without specifying who needs to deliver it. In this case the supply chain is free to assign responsibilities as preferred.

NOTE 4 Different actors can be responsible for different level of information need at the same information delivery milestone to fulfil the same purpose.

EXAMPLE 2 For design purposes, at an agreed information delivery milestone, a wall in a project can be made up of a structural element, architectural cladding and an air duct penetration with an air duct passing through the penetration. Mechanical, electrical and plumbing engineers are responsible for providing reliable information concerning the sizing of the duct and associated desired penetration sizing so that the structural and architectural teams can continue their work to respectively validate the wall structure and cladding design.

5.5 Consider the objects within a breakdown structure

In specifying the level of information need, the objects within a breakdown structure for the information delivery shall be considered.

The level of information need does not specify the objects within a breakdown structure.

To be able to specify the level of information need, the considered objects within a breakdown structure should be specified, identifying the semantic, functional and/or spatial decomposition of the project into objects (e.g. construction elements and spaces are identified) or any other breakdown structure.

NOTE 1 Based on the purpose, the level of information need can be related to:

- a) construction results (spaces, construction complexes, construction entities and construction elements);
- b) construction information (information model, building model, specification, documentation, diagram).

NOTE 2 Breakdown structures can follow a classification system, systems engineering principles or a federation strategy.

NOTE 3 Different purposes can require different breakdown structures and derived decompositions.

EXAMPLE To fulfil the purpose of cost estimation during the construction phase, a breakdown structure can be different from a breakdown structure required for scheduling.

6 Definition of level of information need and its subdivision

6.1 General

The level of information need is the framework which defines the extent and granularity of information to be exchanged. The level of information need should be described by different concepts:

- geometrical information;
- alphanumerical information;
- documentation.

The level of information need can be answered by a combination of geometrical information, alphanumerical information and/or documentation (see [Annex B](#)).

It is possible that information contained within documentation, geometrical information and alphanumerical information overlaps and/or is contradictory, which can create consistency problems within the information