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Technical product documentation (TPD) — Construction documentation — General principles of presentation for general arrangement and assembly drawings

*Documentation technique de produits (TPD) — Documentation de
construction — Principes généraux de présentation pour les dessins
de disposition générale et d'assemblage*

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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 10, *Technical product documentation*, Subcommittee SC 8, *Construction documentation*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/SS F01, *Technical drawings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 7519:1991), which has been technically revised.

The main changes are as follows:

- validation of normative references;
- inclusion of recommendations for site plans and site layout drawings;
- new [Clause 4](#), describing a hierarchy of drawings and defining scopes of general arrangement and assembly drawings;
- new [Clause 5](#), containing updated descriptions of methods for conveying information on drawings;
- new [Clause 6](#), containing identified representations and symbol application requirements;
- new [Annex A](#), providing examples of door and window swing functions and window parts;
- new [Annex B](#), providing examples of materials used in simplified representation;
- some consideration of the use of computer-aided drafting or design (CAD), as well as building information modelling (BIM).

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 aims to condense rules and recommendations from International Standards and give guidance concerning the production of easy-to-read construction drawings, specifically building layouts.

Methods used by the architectural and engineering professions to produce construction drawings varies, from a human holding a pencil or ink pen to computer aided drafting or design (CAD), as well as building information modelling (BIM). Regardless, what is produced as paper deliverables has generally remained consistent. The same presentation approaches and graphical symbols are used.

Further developments in information technology are providing more efficient and convenient methods for delivering, sharing and communicating information. As these technologies evolve, two constant elements relating to what is produced are construction drawings and records. These allow for visual verification and validation using agreed standard presentation methods.

Construction drawings are used by both designers and constructors to communicate using a common language. Regardless of the method of production of the drawing, the content, displayed as lines, symbols, patterns and other techniques predominantly made available on paper or display, is clear, precise and unambiguous in terms of the meaning it conveys.

In this document, the phrase “construction drawing” aligns with the concept of “technical drawing” as defined in the ISO 128 (series). Therefore, it is intended to be interpreted in the broadest possible sense, encompassing the total package of documentation specifying the building.

This document is complementary to the ISO 128 (series) for construction drawings.

The figures included in this document are intended to illustrate the text and/or to provide examples of the related technical drawing specification. These figures are not fully dimensioned and toleranced, showing only the relevant general principles. In all figures, the leader lines using an arrow and text ending with “type” and numbers indicate the line types used for the representations. They are not elements which are presented on a construction drawing.

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Technical product documentation (TPD) — Construction documentation — General principles of presentation for general arrangement and assembly drawings

1 Scope

This document establishes general principles of presentation to be applied to construction drawings for general arrangement and assembly, mainly within the field of building and architectural drawings.

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 128-2, *Technical product documentation (TPD) — General principles of representation — Part 2: Basic conventions for lines*

ISO 128-3, *Technical product documentation (TPD) — General principles of representation — Part 3: Views, sections and cuts*

ISO 3098-1, *Technical product documentation — Lettering — Part 1: General requirements*

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

ISO 7200, *Technical product documentation — Data fields in title blocks and document headers*

ISO 9431, *Construction drawings — Spaces for drawing and for text, and title blocks on drawing sheets*

ISO 10209, *Technical product documentation — Vocabulary — Terms relating to technical drawings, product definition and related documentation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6707-1 and ISO 10209 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

geometrical information

description of detail and extent of information that can be expressed using shape, size, dimension and location

Note 1 to entry: Geometrical information can also describe material and movement of objects.

[SOURCE: EN 17412-1:2020, 3.12, modified — Note 1 to entry added.]

3.2

alphanumeric information

description of detail and extent of information that can be expressed using characters, digits and symbols or tokens such as mathematical symbols and punctuation marks

[SOURCE: EN 17412-1:2020, 3.13]

3.3

graphical symbol

visually perceptible figure with a particular meaning used to transmit information independently of language

Note 1 to entry: A graphical symbol can represent objects of interest, such as products, functions or requirements for manufacturing or quality control.

Note 2 to entry: A graphical symbol is not to be confused with a *simplified representation* (3.4) of a product, which is normally drawn to scale and which can look like a graphical symbol.

[SOURCE: ISO 81714-1:2010, 3.1]

3.4

simplified representation

representation drawn in accordance with the valid rules of projection and on which individual elements of the product are not shown, provided this does not present difficulties in understanding the drawing

[SOURCE: ISO/TS 128-71:2010, 3.2]

4 Construction drawings

4.1 General principles

4.1.1 Standardized and documented approach to communication

Construction drawings shall use a standardized and documented approach to present information that is clear, concise and unambiguous. This shall be achieved using a variety of techniques, such as lines, hatching, shading, colour, text, schedules and lists, as well as references to external sources.

4.1.2 Conveyance of purposes

To lessen the risk of ambiguity, each drawing should minimize the purposes conveyed. The purposes of each drawing shall be identified in the drawing title or supplementary title in accordance with ISO 7200, with additional information provided within the general notes.

The content of a drawing shall be conveyed using identifiable representation and graphical symbols consistent with the purposes. A symbols legend, within the space for text (see ISO 9431), or alternatively a separate legend drawing, shall be referenced to identify the key drawing elements.

4.1.3 Dimensional accuracy

Construction drawings shall be dimensionally accurate and coordinated with geospatial referencing to ensure a common coordinate system. Construction drawings shall be based upon an identified site base datum or point.

Construction drawings shall be produced to different scales depending upon the project needs and identified purposes. The drawings should indicate the intended paper size and each view should indicate the scale.

NOTE 1 A site or project grid on the construction drawings is generally established based upon the site datum.

NOTE 2 See ISO 4463-1 for the relationship between the different grids (structural reference grid, secondary setting-out grid and site grid) and use of secondary (setting-out) lines.

NOTE 3 See ISO 5455 for additional information on scale.

4.1.4 Use of content from scanned sources

Where construction drawings include content from point clouds or photogrammetry, as a record of construction, the content shall be reproduced to ensure that the information provided is both clear and concise in accordance with the documented standards.

4.1.5 Provision and robustness of external references

Where information is referenced from external sources using hyperlinks or similar, the long-term provision and robustness of the link shall be guaranteed or, alternatively, an offline copy shall be provided.

4.2 Types of drawings

Depending upon the object scope of representation, the following construction drawing types can be used:

- site plan, indicating the extent of the construction site and associated works in context;
- site layout drawing, indicating building location, phases, zones or volumes, topography and layout on site;
- general arrangement drawing, indicating the arrangement of elements which represent a whole building or part of a building;
- assembly drawing, demonstrating a spatial region, a functional system or a set of components;
- component drawing, representing a component with its parts;
- detail drawing, presenting a connection between components or enlarged demonstration of a part;
- drawing with schedules and lists.

NOTE 1 See ISO 10209 for definitions of drawing types.

NOTE 2 This document primarily describes general arrangement drawings and assembly drawings, even though many of the techniques are also applicable for other types.

NOTE 3 Documents of specifications or instructions are also used for delivering further information.

Building components which are detailed or specified in other documents, such as component range drawings, detail drawings, parts list and specifications, may be shown in a simplified manner on general arrangement and assembly drawings.

NOTE 4 The degree of simplification depends on the kind of object represented, the scale of the drawing and the purpose of the documentation. This is further described in [Clause 5](#).

4.3 Organization of drawing sets

4.3.1 Supplementary information of drawings

To enhance readability, drawings shall include supplementary information, such as explanations, instructions, references, a location figure and a revision table in accordance with ISO 9431.

Drawing sets may include a common legend explaining lines, notation, elements and graphical symbols used within the set.

Drawing sets shall include referencing to appropriate views or views on drawing, such as plans, elevations, sections, callouts and schedules or to details providing increased level of detailed information. The references can be in the form of hyperlinks to other drawings, documents or different kinds of digital objects.

NOTE Projection methods and representation of views, sections, cuts and cut with mirrored orthographic projection are specified in ISO 128-3.

Further information regarding references to drawings and documents for manufacturing, construction and assembly shall be made, normally in the space for text on the drawing sheet (see ISO 9431).

4.3.2 Hierarchy and grouping of drawings

By definition, site plans and site layout drawings are types of general arrangement drawings. In the context of this document, however, they are viewed as being in the top of a hierarchy of drawings, based on the size of the objects represented. This is shown in [Table 1](#). Drawings may also be grouped into sets based upon other criteria, e.g. identifying organizations, locations, phases, zones or volumes, levels, disciplines and systems.

Table 1 — Hierarchy of drawing types

Types of drawing	Example
Site plan	Geographical location, context and boundary of a building
Site layout drawing	Location of the building, including landscaping features
General arrangement drawing	Building storey
Assembly drawing	Kitchen furnishings
Component drawing	Doors
Detail drawing	Wall section

4.4 Site plan

The site plan is a location drawing showing the boundary and context of the construction site indicating the building(s) location in a plan view (see [Figure 1](#)). The following shall apply:

- The direction of north shall be indicated and preferably be vertical.
- Buildings shall be presented by the footprint (building extent) using continuous extra-wide lines (type 01.3), see [Figure 1](#), line 1.
- The extent of the site boundary shall be indicated using a long-dashed dotted extra-wide line (type 04.3), see [Figure 1](#), line 2.
- The existing context shall be indicated as continuous wide lines (type 01.2), see [Figure 1](#), line 3.
- The geospatial position of either the site boundary or the building, or both, shall be shown.

NOTE In this document, the line type and its number are given according to ISO 128-2.



Key

- 1 line 1, continuous extra-wide line (type 01.3)
- 2 line 2, long-dashed dotted wide line (type 04.2)
- 3 line 3, continuous wide lines (type 01.2)

Figure 1 — Site plan indicating site boundary, building outline, datum and geospatial coordinates.

4.5 Site layout drawing

A site layout drawing shows the setting out of the whole or major parts of a building indicating phases, zones or volumes in context of the construction site in a plan view. The following shall apply:

- The direction of north shall be indicated, preferably in the first quadrant (between right and up).
- Buildings or major parts of a building shall be presented by outlines at ground level (the building footprint) using continuous extra-wide lines (type 01.3), see [Figure 2](#), line 1.
- Outlines of building parts extruding above ground, for example floors, roofs, and balconies, shall be shown using long-dashed dotted wide lines (type 04.2), see [Figure 2](#), line 2.
- Outlines of building parts below ground, for example culverts and cellars, shall be shown using dashed wide lines (type 02.2), see [Figure 2](#), line 3.