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Technical product documentation (TPD) — Construction documentation — Drawings for the assembly of prefabricated structures

*Documentation technique de produits (DTP) — Documentation de
construction — Dessins d'assemblage des structures préfabriquées*

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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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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 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 third edition cancels and replaces the second edition (ISO 4172:1991), which has been technically revised.

The main changes are as follows:

- update of normative references;
- provision of wider levels of drawings;
- replacement of the term “location drawings” by “general arrangement drawings”.

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 requirements for representing prefabricated structures with assembly drawings. Prefabricated structures are construction components that are more likely to be considered as products comprising assemblies, rather than traditional components.

The purpose of this document is to aid with the following aspects:

- defining the drawing types and their hierarchy clearly;
- providing the technical rules within each type of drawing;
- giving guidelines for the application of representation techniques.

Those who draw prefabricated structures are encouraged to think about the methods they use to collect, demonstrate and disseminate product information to all stakeholders, including designers, engineers, manufacturers and contractors. Product information supports stakeholders to recognize product definitions, relations and other requirements identified within the life cycle. It is recognised that the drawing of products, using common lines, symbols and other graphic representations, aids in the organization of the information on the basis of concepts and relationships. Therefore, this document is intended to be adopted in coordination with ISO 7519 and other applicable standards.

ISO 7519 provides a method for organizing presentation approaches for a building, system, assembly, component or part, therefore providing comprehensive information hierarchically. Such a delivery method is advanced to regularize the flow of information within the supply chain. It does this by specifying a clear scope for requirements or specific objects using building information modelling (BIM) or other computer-aided design and drafting (CAD) applications, thereby enhancing the effectiveness of the processes involved by presenting unambiguous and sufficient data.

This document establishes the rules for prefabricated structures following the principles in ISO 7519 while maintaining symbolic representation applicable in the built environment sector. International Standards relating to technical product documentation developed by ISO/TC 10, as well as BIM International Standards developed by ISO/TC 59/SC 13, are considered helpful in adopting this document.

The figures included in this document are intended to illustrate the text and 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 that are presented in a construction drawing.

Technical product documentation (TPD) — Construction documentation — Drawings for the assembly of prefabricated structures

1 Scope

This document specifies general requirements for the preparation of construction drawings intended for the field assembly of prefabricated structures for building and civil engineering works.

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 129-1, *Technical product documentation (TPD) — Presentation of dimensions and tolerances — Part 1: General principles*

ISO 4157-1, *Construction drawings — Designation systems — Part 1: Buildings and parts of buildings*

ISO 6284, *Technical product documentation — Construction documentation — Indication of limit deviations*

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 7519¹⁾, *Technical product documentation (TPD) — Construction documentation — General principles of presentation for general arrangement and assembly drawings*

ISO 7573, *Technical product documentation — Parts lists*

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

ISO 14405 (all parts), *Geometrical product specifications (GPS) — Dimensional tolerancing*

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/>

1) Under preparation. Stage at the time of publication: ISO/FDIS 7519:2023.

3.1 assembly

set of related components attached to each other

Note 1 to entry: An assembly can be an aggregation which performs a systematic function, e.g. a structural frame, truss or modular container.

Note 2 to entry: An assembly can be a nested form, i.e. it can consist of sub-assemblies.

[SOURCE: ISO 6707-1:2020, 3.3.5.5, modified — Notes 1 and 2 to entry added.]

3.2 prefabricated structure

structure consisting of prefabricated *structural members* (3.3)

3.3 structural member

part of a structure intended to resist forces

Note 1 to entry: In this document, a structural member is commonly a component, sometimes an assembly, such as a modular unit or an assembled truss, which is delivered to the construction site as a purpose part.

[SOURCE: ISO 6707-1:2020, 3.3.1.3, modified — Note 1 to entry added.]

4 Documentation

4.1 General

4.1.1 Types of drawings and documents

The documentation for prefabricated structures shall comprise the following documents:

- general arrangement drawings;
- assembly drawings (as required);
- component drawings;
- detail drawings;
- either component schedules or a parts list or both;
- specifications.

Structural members and other relevant objects represented on each type of drawing shall be appropriately detailed to clearly communicate design information in accordance with ISO 7519.

4.1.2 Application of lines

The application of lines for the designated components shall be as follows:

- continuous extra-wide lines (type 01.3) indicating outlines in the cutting plane (see [Figures 1, 2 and 3](#));
- continuous wide lines (type 01.2) indicating edges for visible linear components and dashed wide lines (type 02.2) for hidden components (see [Figures 1 and 2](#));
- continuous wide lines (type 01.2) indicating edges for visible panels, slabs or blocks and dashed wide lines (type 02.2) for hidden components (see [Figures 3 and 4](#));

- in cases where all linear components are represented with single lines, as extremely simplified presentations, continuous extra-wide lines (type 01.3) indicating axial lines for visible linear components and dashed extra-wide lines (type 02.3) for hidden components (see [Figures 2](#) and [5](#)).

NOTE 1 In this document, the line type numbers are given in accordance with ISO 128-2.

The reference grid shall be drawn with grid lines and the modular grid shall be drawn with modular lines (see ISO 8560). The application of lines shall be as follows:

- continuous narrow lines (type 01.1) for modular lines for the first stage, and continuous wide lines (type 01.2) for the second stage;
- long-dashed dotted narrow lines (type 04.1) for grid lines or modular lines in an axial position (see [Figures 1](#) and [8](#)).

Leader lines and reference lines shall be executed as a continuous narrow line (type 01.1) (see [Figure 8](#)).

NOTE 2 See ISO 128-2 for more information about the basic conventions and applications for leader lines and reference lines.

4.1.3 Presentation of dimensions

The general principles for presentation of dimensions shall be in accordance with ISO 129-1.

4.1.4 Indications of tolerances and limit deviations

Dimensional tolerances shall be in accordance with the ISO 14405 series.

Indications of limit deviations shall be in accordance with ISO 6284 when presenting the following information:

- allowable manufacture tolerance;
- allowable construction tolerance.

4.1.5 Instructional information

Instructional information for the assembling process, including design charts or loading schemes, may be given in the space for text on drawings defined by ISO 9431.

The design charts or loading schemes can indicate loading limitations, erection procedures and other details concerning erection.

4.2 General arrangement drawings

4.2.1 General

A general arrangement drawing shall be a simplified representation of a prefabricated structure and the location of designated structural members.

4.2.2 Presentation

The general arrangement drawing(s) should present prefabricated structural members by showing the following:

- reference grid or modular grid relating to the construction works;
- structural members and their designations;
- relationship of structural members to the reference grid, modular grid or coordinates of key points;

- specific levels of structural members;
- reference to other drawing types.

NOTE 1 The key points can be either the vertexes on an outer corner, the midpoint on an edge or the centroid of a shape, whichever is more likely to be the best point for location. Best practice dictates that the same type components are designated the same key points.

The designated components shall be represented symbolically or by their simplified low-detail representations, as illustrated in [Figures 1 to 6](#).

For each group of components for prefabricated structures connected by similar construction conditions, the general arrangement drawings should indicate the sequence of their application during assembly.

NOTE 2 See ISO 7519 for details of simplified representation and other techniques used here and in the rest of this document.

4.2.3 Views and scales

The prefabricated structural members should be shown in a sufficient number of different views to effectively communicate the design information. Views should be in accordance with ISO 128-3.

The preferred scales for the general arrangement drawings are 1:50, 1:100 and 1:200.

4.2.4 Indication of designations

Each component shall be marked with a designation code in accordance with [Clause 5](#) to indicate it is a prefabricated component.

4.2.5 Presentation of underground structures

The following should be shown on the general arrangement drawings of prefabricated foundations and other underground structures:

- outline of foundation beds (type 01.2), foundation sublayers (type 02.2), foundation beams (type 01.3 or 01.2 for outlines), basement walls (type 01.3 and shading or hatching is required);
- their sizes;
- their relationship to reference grids or coordinates.

General arrangement drawings for foundation and other underground structures shall be represented on the assumption that the ground is transparent.