

BRITISH STANDARD

Collaborative production of architectural, engineering and construction information – Code of practice

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 32, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution and came into effect on 31 December 2007. It was prepared by Technical Committee B/555, *Construction design, modelling and data exchange*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

BS 1192:2007+A2:2016 supersedes BS 1192:2007+A1:2015, which is withdrawn.

Information about this document

Text introduced or altered by Amendments No. 1 and No. 2, respectively are indicated in the text by tags **A1** **A1** and **A2** **A2**. Minor editorial changes are not tagged.

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The changes incorporated in this revised standard include:

- Management processes to support collaborative working.
- Extending controlled naming to files and directories, as well as layers and sub-models.
- Compatibility with BS EN 82045-2 and ISO 82045-5.
- Incorporation of BS ISO 12006-2 compliant classification tables, such as Uniclass.
- Recommendations for implementation of BS EN ISO 13567-2.

Use of this document

As a Code of Practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

The word “should” is used to express recommendations of this standard. The word “may” is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word “can” is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this standard. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Introduction

Collaboration between the participants in construction projects is pivotal to the efficient delivery of facilities. Organizations are increasingly working in new collaborative environments in order to achieve higher standards of quality and greater re-use of existing knowledge and experience. A major constituent of these collaborative environments is the ability to communicate, re-use and share data efficiently without loss, contradiction or misinterpretation.

Each year considerable resources are spent on making corrections to non-standard data, training new personnel in approved data creation techniques, co-ordinating the efforts of subcontractor teams and solving problems related to data reproduction.

The use of this standard is particularly applicable where technology enabled processes are used to support projects. These processes include:

- automation of  3D model, data,  drawing and document production processes;
- indexing and searching project material;
- filtering and sorting;
- quality checking and document comparisons.

Where the implementation of standards is adequately addressed, there are significant benefits to both the productivity of project teams and the profitability of the organization.

This standard applies to all construction project documentation. The set of project documents and each document within it are viewed as a hierarchy of named containers. It gives recommendations for structured names to convey information (meta-data) about the containers required for effective information management and exchange.

It is clear that standards and this British Standard in particular, are one way to enable project team members to work together more efficiently and accurately on construction projects. This standard enables increasing confidence in the use of a common naming convention and approach to collaborative working for use in architecture, engineering, construction and facilitates efficient data use in facilities management.

1 Scope

This standard establishes the methodology for managing the production, distribution and quality of construction information, including that generated by CAD systems, using a disciplined process for collaboration and a specified naming policy.

It is applicable to all parties involved in the preparation and use of information throughout the design, construction, operation and deconstruction throughout the project lifecycle and the supply chain.

The principles for information sharing and common modelling are equally applicable to building and civil projects.

This standard is also a guide for developers of software applications to enable them to support its implementation through the provision of configuration files or application add-ons.

NOTE 1 The standard is an alternative where the formal meta-data recommendations as provided in BS EN 82045-2 and ISO 82045-5 cannot be used because of the absence of a compliant and common document repository within an organization or project team.

NOTE 2 This standard does not give guidance on the use of different data exchange file formats, the exchange of non-graphic data, structuring nor the exchange of data held as object classes and their instances nor the data structuring appropriate to specialist engineering analyses, nor the definition and use of data held as instance parameters.

2 Normative references

The following referenced document is indispensable for the application 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.

BS ISO 12006-2, *Building construction – Organization of information about construction works – Part 2: Framework for classification*

NOTE The implementation of BS ISO 12006-2 in the UK is published under the name “Uniclass”.

3 Terms and definitions

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

3.1 code

sequence of characters, often a mnemonic, having defined meaning when interpreted in the context of the field in which it is entered, used to concisely convey meta-data

3.2 container

named persistent set of data within a file system or application data storage hierarchy including, but not limited to, directory, sub-directory, data file, or distinct sub-set of a data file, such as a chapter or section, layers or symbol

NOTE 1 “Named containers” is the common pattern on structured information for design and management. The actual implementation of “named containers” might be different in different operating systems and proprietary file formats. The “named container” pattern is, however, distinct in that a single name is associated to a collection. The principles of this standard can be applied independently of the actual implementation of the “named container” pattern.

NOTE 2 Directories include sub-directories and folders.

NOTE 3 Files include models, sub-models,  data,  sheets, documents, tables and schedules.

NOTE 4 Containers within files include layers, sections and symbols.

3.3 conventional Cartesian axis

geometric convention using positive co-ordinates (X, Y, Z) ordered as (East, North, upwards), so that conventional plans use X, Y; and Z is upwards

3.4 document

container for persistent information that can be managed and interchanged as a unit

[BS EN 82045-1, ISO/IEC 8613-1, **3.2.3** modified]

3.5 drawing

document used to present graphic information

3.6 field

part of a container name reserved for meta-data

NOTE The standard controls the usage of fields for naming containers and codes used in those fields.

3.7 instance

occurrence of an entity at a particular location and orientation within a model

3.8 layer

container comprising selected entities, typically used to group for purposes of selective display, printing and management operations

3.9 meta-data

data used for the description and management of documents and other containers of information

NOTE Each item of meta-data resides in a field. Codes are the values allowed for fields.

3.10 model

collection of containers organized to represent the physical parts of objects, for example a building or a mechanical device

NOTE 1 Models can be two-dimensional (2D) or three-dimensional (3D), and can include graphical as well as non-graphical content. This standard is based on generating, sharing, etc., model files, not just drawings. Drawings are produced when the model is complete, correct and consistent.

NOTE 2 Models can include information by reference.

[A1] *NOTE 3 Information Models are a collective of 3D Models, Information/Data, (non-graphical), documents, drawings and any other information needed to deliver the project. **[A1]***

3.11 originator

agent responsible for production of a container

NOTE See Clause 7.

3.12 sub-model

model included as an instance in another model

4 Collaboration management processes

4.1 Process considerations

4.1.1 Standard method and procedure

Projects should follow a common set of generic processes at the highest level, which are fine-tuned on a project-by-project basis. The procedures outlined apply to all approaches to project design production, [A1](#) and co-ordination of the information model. [A1](#)

4.1.2 General project issues

The project “standard method and procedure” should be agreed and committed to by all the relevant parties involved in the project (e.g. the client, design consultants, supply chain partners, etc.) at the pre-construction contract stage in the project lifecycle.

To implement the “standard method and procedure” the following elements should be in place:

- Roles and responsibilities should be agreed, in particular the responsibility for design co-ordination of the various design disciplines.
- Naming conventions should be adopted according to Clauses **5** to **15**.
- Arrangements should be in place to create and maintain the project specific codes as described in **6.3** to **15.4.3** and project spatial co-ordination as described in Annex A.
- A “Common Data Environment” (CDE) approach should be adopted to allow information to be shared between all members of the project team (see **4.2**). This is a repository, for example a project extranet or electronic document management system.
- A suitable information hierarchy should be agreed that supports the concepts of the CDE and the document repository as indicated in **5.4.2**.

4.2 Process and the Common Data Environment (CDE)

4.2.1 Outline of a Common Data Environment

NOTE 1 There are four phases of the CDE as illustrated in Figure 1.

Information, once prepared, should be placed into the WORK-IN-PROGRESS (WIP) (see 4.2.2) area and passed through the model in an anti-clockwise direction through the phases of its life.

NOTE 2 The naming, numbering and identification of all data held in the CDE are defined in Clause 5.

Key to the process is the management of moving the data between each of the four phases (see 4.2.2, 4.2.3, 4.2.4 and 4.2.5), it is here that vital checking, approving [A1], authorizing and accepting [A1] processes are executed.

4.2.2 WORK-IN-PROGRESS

The WIP area of the CDE (see Figure 2) is where members of the project team carry out their own work using their organization's software systems. Whether the common repository or an organization's in-house repository is used, the models and documents should employ a similar management process as that used for the total project.

The organization is responsible for the quality of the WIP information and should ensure that appropriate checking and review processes are in place.

NOTE 1 Each model [A1] text deleted [A1] only contains information for which each [A1] task [A1] team is responsible.

NOTE 2 The organization also includes work package subcontractors who develop design based on consultants' design, where contracts require this specific approach.

The data continues to be updated in the WIP area and [A1] options [A1] should be indexed to indicate minor version changes, e.g. [A1] P02.01 [A1], etc. [A1] Text deleted [A1]

Figure 1 Document and data management repository

